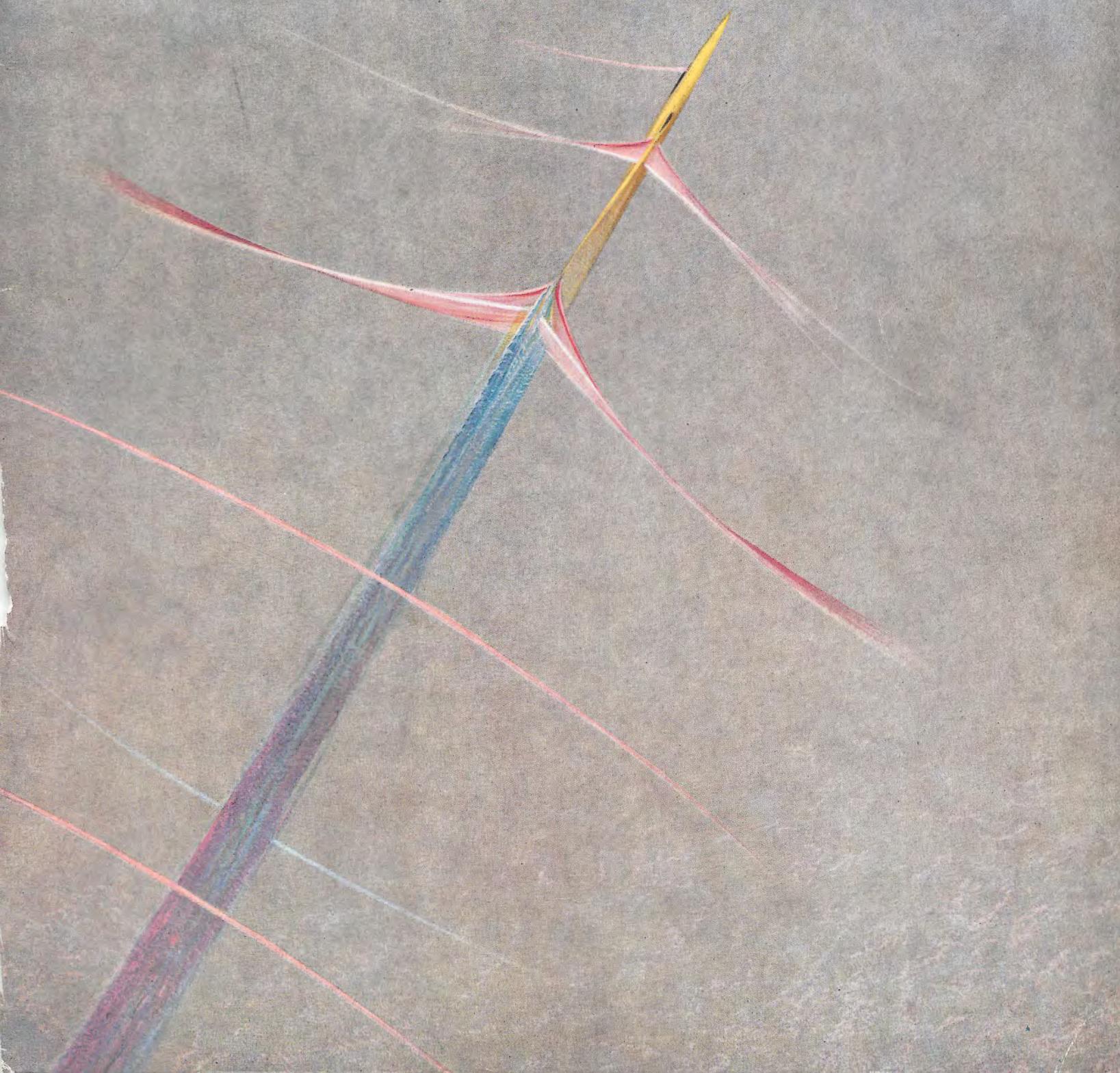


DE HAVILLAND GAZETTE

NO. 96 DECEMBER 1956





A Happy Christmas and a Prosperous New Year.

DE HAVILLAND GAZETTE

Number 96

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From one of the de Havilland Engine Company's collection of paintings by W. Howard Jarvis, S.A.V.A., the front cover picture illustrates the shock-wave pattern which occurs at speeds just above the velocity of sound. The bow-wave, as yet unattached, is seen ahead of a climbing aircraft and strong shock waves, with flow separation, have already appeared on the wings and tail. The rear shock waves give an impression of the Mach cone formed by the aircraft's passage through the atmosphere ... 185

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Acknowledgments for some of the photographs reproduced in this issue are due to: H. Philips; C. Lamote; R. du Cane; A.P.A. Sydney; Shinchosha Japan; Mirrorpic London; Ankers Washington. 228

Greetings!

ALL good wishes to *Gazette* readers everywhere. A happy and peaceful Christmas Season to you, despite alarms and skirmishes. The times are perilous as these words are written, but so they have been for many years. Aggrandisement of the State as an institution is at last beginning to produce the world-wide revulsion which was inevitable. The family is what matters.

Trade (so we wrote in this page a year ago), trade is the peacemaker. The freer it can be made the better for everyone in the long run — not merely in the exchange of each country's more prolific wares, but in the breakdown of the barriers that artificially separate peoples whose real interests are not in conflict. It is these false barriers which inhibit what we might call at this season the Christmas spirit.

From our own country we are exporting twice the volume of goods that left these shores before the war — and that in a period of unprecedented industrial reconstruction within, and while building 300,000 houses a year to make good the war-time destruction and neglect.

The task of re-equipping our factories which has occupied us these several years is now well ahead. More capital goods will thus become available for export. Simultaneously our modernised industries will be producing more and better goods. A marked advance in this country's competitive ability in the world markets is to be expected, aided perhaps by a lessening pressure for the building and other needs of our own fifty million people.

The trend is visible in Britain's aircraft industry, now exporting to the tune of £100 million a year, and de Havilland has had to work hard indeed to account for a fifth of the country's aircraft and engine exports in the twelve years since the war ended — the war that swallowed up £4,000 million of Britain's overseas investments.

Trade is indeed the peacemaker. All our contacts, all the comings and goings of de Havilland engineers, whether selling or servicing, emphasise the beneficent effects of plain business in a world where the conflicts of politics might well fade out before the prosperity that liberal exchanges can bring about.



Conversion work at Chester on one of the Comet 1A aircraft of the Royal Canadian Air Force. The lofty modern factory at Chester is admirably suited to the building of world airliners; indeed it is one of the finest works in any country.

The changing scene at Chester, where the conversion of Comet 1A and 2 aircraft is serving as an educational operation for the building of Comet 4 and 4A liners. The large jigs and the scaffolding are now spreading out across the million-square-foot factory, which for years has been largely occupied with the production of Vampires and Venoms—and will continue with a fighter programme as well as turning out the familiar Doves and Herons. Major components for the Comets will come in from the Chester shops and from several other factories.

Early phase of **COMET**

Several de Havilland factories take on fresh interest as detail fabrication swings ahead on hundreds of components for the new Comets. Assembly halls are replanned: conversion of Comet 1A and Comet 2 aircraft prepares men and machine tools for major production tasks on much bigger Comets, embodying remarkable new manufacturing techniques.



Production



The Hatfield fuselage hall (one end of it) now jigged for Comet 4 and 4A fuselage assembly, which will be fed from other D.H. factories. The main aircraft halls at Hatfield and Chester will deliver finished aircraft from 1958, the Comet 4A work keying in logically with Comet 4 production.

At Lostock, Lancashire, 200 miles north of Hatfield, the exceptional resources of the de Havilland high-precision machine shop were long ago enlisted in the manufacture of the Comet bogey undercarriage units. The complex machining layout for the main forgings is recorded by a photographic system. Quantity production for the new Comets is in full swing now.



Comet main undercarriage leg forgings are checked in onto the floor of the main machine shop of de Havilland Propellers Ltd. at Lostock, where fabrication and assembly of the complete undercarriage unit is in progress to a rising programme.



Comet keels are being manufactured at the Portsmouth de Havilland factory on the south coast of England. Here is seen the fabrication and assembly of fuselage bulkheads for the Comet 4 and the 4A.



The keel of a Comet 4 fuselage being assembled on a special jig at Portsmouth. Part of the planning is for the Portsmouth factory to concentrate on the D.H.110 fighter production after the completion of the fifth Comet 4 keel.



A new process of interest is the milling of spar webs for Comet 4 and 4A aircraft, to which automatic tool control is being applied. A web section previously assembled from more than 20 separate components is now milled from a solid billet, saving work and weight while giving increased strength.

Retirement of Mr. F. T. Hearle

A Biographical Note

MR. F. T. Hearle, C.B.E., F.R.Ae.S., M.I.P.E., who retired from the Board of Directors of de Havilland Holdings Ltd., on September 30, 1956, was Sir Geoffrey de Havilland's first associate in aviation and one of the founders of The de Havilland Aircraft Co. Ltd. at the inception of the company on September 25, 1920.

He is one of the five men who built the de Havilland business from its very modest beginnings into a world-wide group of companies. He was made a director as early as April, 1922, and was General Manager through the nineteen twenties and early 'thirties, when de Havilland entered the engine and propeller fields and when subsidiary companies were formed in Australia, Canada, India and South Africa. As Managing Director from November, 1938, in the pre-war period of rearmament and throughout the years of the great war-time expansion, he bore the responsibility for the output of de Havilland aircraft, engines and propellers until the peak of the war effort was passed in 1944. During his period as chief executive the pay-roll of the Enterprise at home and overseas rose from some 5,000 to more than 38,000. His services to the nation were recognised in 1950 when he was appointed a Commander of the Order of the British Empire.

Mr. Hearle was Chairman of the Aircraft Company for four years from July, 1950, when it was the parent concern not only of the overseas companies formed before the war but also of the Engine and Propeller Companies which became separate entities in 1944 and 1946. During the post-war decade, although he has not borne the day-to-day responsibilities of his earlier years, the benefit of his long experience and excellent judgment has been available in all the deliberations upon which the policy of the Enterprise has been based.

In a message to all de Havilland people upon his retirement Mr. Hearle refers to the remarkable opportunities that lie ahead and to the need which the industry has for young men. "I have always been keenly interested in bringing along the younger people," he writes, "and they have never disappointed us. I feel the greatest confidence in the generation which is moving into responsibility."

Like almost every executive we have, as the *de Havilland Gazette* recorded in 1950, Francis Trounson Hearle started life at the foot of the ladder. He is a Cornishman, born in 1886 at Penryn. He left school at 13½ years to be apprenticed to Cox & Co., marine engineers at Falmouth, engaged upon building tugs, ship repairing, etc. For 7½ years he worked in the yard there, attending evening-classes in engineering and general subjects. Then, not choosing to go to sea, he secured a job with the Vanguard Motorbus Company at Walthamstow, where in bachelor lodgings he first met young Geoffrey de Havilland.

At this time (1908) the Wright brothers were carrying out some very interesting tests on their biplane, and de Havilland, who keenly followed the reports of their experiments, obtained an advance from his grandfather of £1,000 and invited Hearle to assist him in building an aeroplane. They left Vanguards and, renting a small workshop in Fulham Palace Road in London, designed and built their first machine.

The tribulations which led to successful flight in 1910, when the money was giving out, and the story of their both joining the Government

for opportunities which arose. Mr. Hearle recalls how the 4R, fitted with Napier Lion, won the Aerial Derby in 1919, also how the D.H.4A, converted two-passenger aircraft, inaugurated the London-Paris service of Air Transport and Travel Ltd.

When the new de Havilland Company was formed in September, 1920, Mr. Hearle was amongst the founders and was appointed as Works Manager. The experienced team moved into rented premises at Stag Lane, Edgware, with a few lorry loads of equipment and partly finished machines which were taken over from the now defunct Aircraft Manufacturing Company.

From a struggling little unit of 50 or 60 cheerful, hard-up, industrious men with two D.H.18's to finish and vague ideas about what to do next, to a notable world group of companies at the peak of the second world war, with a 25-million-pound annual turnover (not counting shadow-factory and Dominion production) Mr. Hearle managed the works and dealt with many of the production problems which arose. It was he who planned an engine factory and got it up and going in 16 weeks in 1927, who laid out the Hatfield works in 1930, who went to America in 1934 for enquiries which led to the British Empire licence for Hamilton controllable propellers, and was instrumental in introducing this innovation into the British industry.

In all the great developments of peace and war nothing mattered more than the close working understanding between those responsible, and Mr. Hearle's speedy responses to the changing needs were of course locked up with the technical and financial policy of the organisation as a whole, in the delineation of which his knowledge and assessment always played a decisive part. His was one

of the five responsible minds. With Captain de Havilland's design ability and foresight, Mr. Nixon's grip of the financial structure and outlook, Mr. Walker's scientific appraisal and Mr. St. Barbe's sales drive, Mr. Hearle maintained the clear, close appreciation, and the mutual confidence which enabled every step to be taken with calm resolve, ventures being frequent but gambles unthinkable.

In the practical as well as financial matters the benefit of Mr. Nixon's clear-sightedness was always sought, and it was natural that Mr. Nixon should step forward and take over when the doctor advised Mr. Hearle to relinquish the reins of day-to-day administration in August, 1944, two months after D-day.

Educational and literary matters have been close to the centre of Mr. Hearle's interests, and apprenticeship training found in him an ardent proponent and able organiser. The apprenticeship scheme which he initiated at Stag Lane in the very early days blossomed under his attention into the de Havilland Aeronautical Technical School in 1928, when the Moth

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balloon factory at Farnborough early in 1911, have been told in earlier *Gazettes*. At the end of 1912 Mr. Hearle was offered a better position, as works foreman at Déperdussin in Highgate, where a few aeroplanes were being made for enthusiasts, but the company failed a year later and Mr. Hearle joined Vickers at Erith. War broke out and he was given the task of starting up a works at Weybridge and building B.E.2 biplanes, designed by de Havilland at Farnborough.

In 1917 Mr. Hearle was sent to America with a mission to get the Vickers Scout adopted there, but in this they were not successful and on his return Hearle rejoined "D.H.", who since early 1914 had been chief designer at the Airco works at Hendon and was then busy with the D.H.4. Hearle took charge of the experimental shop there, and built subsequent D.H. prototypes.

On the conclusion of the war a rather disheartening period followed and hopes of swift development in civil aviation were not very encouraging. Airco struggled along. Existing machines like the D.H.9 were modified

PRINCESS MARGARET IN TANGANYIKA



During her recent tour of East Africa Her Royal Highness The Princess Margaret made several journeys in a Heron of the Queen's Flight. She is here seen alighting from the aircraft at Sao Hill aerodrome, in Tanganyika.

HONOURED IN WASHINGTON

At the White House in Washington, on October 23, President Dwight D. Eisenhower presented the three Harmon International Trophies which, as reported in the Gazette of October, 1956, had been awarded by the Clifford B. Harmon Trust to Madame Jacqueline Auriol, Lt.-Cdr. Charles A. Mills, U.S.N., and Mr. John Cunningham, de Havilland chief test pilot. In the accompanying photograph taken at the White House are, left to right, Mr. A. F. Burke, Managing Director of The de Havilland Aircraft Company Ltd., Mr. William E. Schramek, one of the Trustees, Mr. John Cunningham, Madame Auriol (whose record made in a Mystère jet fighter on May 31, 1955, placed her as the fastest woman pilot), President Eisenhower, and Lt.-Cdr. Mills, U.S.N., who received his award for operating his airship in an ice-accreting experiment, unparalleled in airship history, made on December 4, 1955. In the foreground the Harmon Trophies are visible; they are, left to right, the aviator's, aviatrix' and aeronaut's awards, respectively.



SUCCESSOR TO THE COMET

Discussions with B.O.A.C.

The British plans for a larger jet airliner than the Comet 4 were clarified by the Minister of Transport and Civil Aviation, the Rt. Hon. H. Watkinson, M.P., speaking in the House of Commons, London, on Wednesday, October 24, just as this Christmas issue of the *de Havilland Gazette* was closing for the printers.

As an exceptional measure to bridge the gap until a new British type is produced, stated the Minister, the British Overseas Airways Corporation are to purchase fifteen Boeing 707 liners powered by Rolls-Royce Conway jet engines, to operate the North Atlantic route from 1959-60. This step is part of plans to enable B.O.A.C. to obtain a larger share of growing world passenger traffic.

He went on to say that the Corporation are meanwhile urgently discussing with the de Havilland Aircraft Company the technical details of an aircraft that will be sufficiently flexible to meet their requirements and command a ready sale in world markets.

As soon as a satisfactory specification has been agreed, he said, B.O.A.C. will place an order.

The de Havilland aircraft now under consideration is the D.H.118, and its specification and timing have long been under close

study with operators. Details are still being discussed. The basis of the study has been the importance placed upon economic and operational flexibility. The British Overseas Airways Corporation, like carriers in so many parts of the world, must prepare for the phase that will call for range-payload capabilities beyond those of the Comet 4 and 4A, but insist that the aircraft be economical on those routes far and wide which will not enjoy the large traffic potential of the exceptional North Atlantic sectors. And it is not only on grounds of economy that the later aircraft must fulfil this "far-and-wide" adaptability; it must also be fully capable of operating long ranges out of existing main-line airports without calling for extensive strengthening (reconstruction) and lengthening of runways such as would be justified only by intense traffic.

The D.H.118, programmed for service from 1962, would be somewhat smaller than the large American jet liners but comparable to them in speed and range capabilities. Considerably larger than the Comet 4, it would be capable of operating the North Atlantic non-stop, while the carrying capacity, economy, airport behaviour, etc., would afford the operational flexibility which the Corporation demand. One of the considerations is that the winter

traffic over the North Atlantic is likely to remain substantially less than the summer traffic with its big "vacation" element.

The suitability of such a specification to operators in many parts of the world, who have a problem comparable to that of B.O.A.C., and one that has to be resolved without delay, is obvious.

de Havilland experience in the progressive development of the basic Comet design has throughout been concentrated upon lines that lead logically to the type of specification outlined above, a fact that is of the utmost value in the work now being done.

Furthermore, British gas-turbine development over many years has been directed to the class of operation now planned. The de Havilland Ghost initiated civil jet operation in the Comet 1 in 1952 with a degree of economy, reliability and durability contemporarily outstanding. In the field of supersonic flight the Gyron and Gyron Junior offer the same characteristics. British turbine progress in the civil field, as exemplified in such power units as the Rolls-Royce Avon and Conway jet engines, keys in with the type of economical performance which is the essence of the Comet 4 and 4A capabilities and is envisaged, with even greater emphasis, for the D.H.118.

TRAINER EXPERIENCE



Sir Geoffrey de Havilland, deeply interested in training technique since he taught himself to fly in 1910 (with 45 b.h.p. behind him), flew to Oakington in a Vampire Trainer on October 24, and reviewed the passing-out parade of No. 117 Course at No. 5 Flying Training School, Royal Air Force. Pinning wings onto the tunics of the young graduates, he contrasted the early days,

when pilots joined squadrons after 10 hours of training, with the present system in which they must start with 120 hours in the 550-h.p. Provost and then do about 110 hours in the Vampire Trainer before becoming fledged. On the saluting dais he is accompanied by G/Capt. J. E. Kirk, O.B.E., the Station Commander at Oakington, which is near Cambridge.





A sentry stands guard over the main hangar at Leopoldville Aerodrome as a Dove is towed in for the night.

The Air Force of the Belgian Congo

Dove and Heron Aircraft serve with Aviation de la Force Publique



Commandant G. Thonnard (left), the new Commander of Aviation de la Force Publique, with Commandant R. Hirsch, the Second-in-Command of the force.

THE Belgian Congo comprises 905,000 square miles of land in the heart of Africa. The majority of the territory consists of dense, tropical forests and, around the great Congo River and its many tributaries, swamp and marshland. The Congo is rich in deposits of copper, radium, gold and diamonds; copper, the most important of these minerals, is mined extensively in the south-east, more than 1,000 miles from Matadi, the country's sole seaport, which stands near the mouth of the River Congo. The latent wealth of the Congo is

being developed by the Belgian Government on a steadily expanding scale, and the European population, hitherto small, is expanding rapidly.

Land communications within the Congo are extremely difficult. The country's industrial centres are widely separated, and there are few roads between them. River and railway networks link Leopoldville, the capital, with the country's other major towns, but the long distances involved make these forms of travel slow and arduous.

Maintenance of order within the Congo, and the work of safeguarding the Colony, is the responsibility of "La Force Publique", an army made up from locally-recruited Africans administered by European officers. This force was formed in 1886 and has thus this year reached the seventieth anniversary of its foundation.

"Aviation de la Force Publique," a squadron of aircraft under the control of the commander of the main army, was formed at Leopoldville in 1941. Its purpose was to provide efficient liaison and communications for the widely-scattered detachments of Force Publique. The nucleus of men for the new force was recruited by means of a broadcast made over the Congo radio service by Capitaine Burniaux, a pilot who had escaped from the Belgian flying school in North Africa, which was by then occupied by the enemy. They were trained with the South African Air Force, and returned to Leopoldville to fly,

in the first place, a number of requisitioned de Havilland Leopard Moth and Fokker aircraft and, later on, six Airspeed Oxfords which were purchased by Force Publique. The early workshop equipment was rudimentary, and

Lieutenant-Colonel D. Colin, who has recently retired from the position of Commander of Aviation de la Force Publique, an appointment which he had held since 1949.





Force Publique operates ten Dove aircraft; eight of these are seen here at Leopoldville, together with the Heron which is used as a personal transport for the Governor-General of the Belgian Congo.



African workers remove the ancillary equipment from a Gipsy Queen 70 engine which has become due for overhaul.

shortage of hangar space meant that the aircraft spent most of their time in the open. The object was achieved, however, and this small force played a considerable part in maintaining the wartime security of the Belgian Congo.

The work done by Aviation de la Force Publique during the war made clear the value of keeping a permanent air force within the Congo in time of peace. In 1948, therefore, six new Airspeed Consul aircraft were purchased to replace the war-weary Oxfords. These were soon supplemented by Force Publique's first de Havilland Dove, which was acquired as a personal transport for the Governor-General of the Congo; it was quickly followed by more aircraft of the same type.

In 1949 the headquarters of the force was moved to Ndolo Aerodrome, the international airport of Leopoldville, and for the first time Force Publique was housed in modern hangars and offices.

The fleet of aircraft operated by Aviation de la Force Publique to-day comprises ten de Havilland Doves, one Douglas Dakota and one de Havilland Heron. The Heron, which was purchased in 1954, is the personal transport

for the Governor-General, and was used to carry King Baudouin during his visit to the Congo in the early summer of 1955.

The main duties of the Doves include communication and liaison work with Force Publique and with civilian executives throughout the country: reconnaissance and supply-dropping: the evacuation to hospital from remote areas of urgent medical cases; the transportation of freight, including medicines, serum, dynamite, and — a frequent

load — monkeys needed for poliomyelitis research: insect spraying, with insecticide mixed with crude oil injected into the engine exhaust manifolds, and aerial photography for the Government cartographic service.

The Force Publique aircraft operate, in the main, from small, rough aerodromes over country in which a successful forced landing would be virtually impossible. The climate is hot and humid, and thunderstorms are frequent in the wet season: the weather is generally too

An exhibition was held at Leopoldville in the summer of 1956 to mark the seventieth anniversary of the formation of Force Publique. All the activities of the force were represented; the section devoted to Aviation de la Force Publique included a Dove and one of the original Leopard Moths requisitioned by the Force at its inception in 1941.



One of Force Publique's ten Doves is cleaned down at Ndolo Aerodrome at the end of a day's flying. A truck which has brought spare parts from C.E.G.E.A.C., the de Havilland agent in Leopoldville, stands in the foreground.



A new hydraulic pump is received into the main stores, which carries sufficient spare parts for three years' operations.



The wives of two of the soldiers of Aviation de la Force Publique return with their shopping to the African camp at the edge of Leopoldville Aerodrome.

unsettled for any accurate forecasting to be made. Radio facilities are good, and there is HF coverage throughout the territory. The major aerodromes have VHF communication, VHF DF fixers and radio-beacons, but in bad weather reception is severely affected.

All the commissioned officers serving with the force are Belgians who have volunteered for service in the Colony. Seven of them are pilots, thirteen are engineers, and five are wireless operators; their normal tour of duty comprises a three-year period spent in the Congo, followed by six months leave in Belgium. Serving under these 25 Europeans are 75 Africans, whose responsibilities include cleaning and dismantling the aircraft and engines prior to

maintenance or repair, storekeeping, general workshop duties, and handling the aircraft on the ground. These Africans live with their families in a camp adjacent to Leopoldville Aerodrome.

Workshop equipment is comprehensive and well laid out within the restricted space available in Force Publique's two hangars. There are separate bays for work on engines, propellers, hydraulics, and instruments, and the large parts

Africans carry out maintenance on a Gipsy Queen engine on one of the Doves. All the African ground crew members of Force Publique are given periodical flying experience.



store contains an air-conditioned section set aside for such perishable items as rubber parts and parachutes. Sufficient spares and raw materials are carried to last for three years.

The rare failures experienced with the Dove and Heron aircraft are an indication of the high standard of maintenance. At no time since the purchase of the first of these aircraft in 1948 has there been need to carry out a forced or a single-engined landing. The rough airstrips from which the aircraft operate do, however, cause occasional burst tyres.

The photographs on these pages show something of this small but effective force whose existence has become vital to the security of the Belgian Congo.



One of the six Airspeed Consuls which were purchased in 1948 and which have now been replaced by the Doves. Ambulance work plays an important part in the operations of Aviation de la Force Publique.



The hydraulic test section of the Force Publique workshops. African soldiers are employed extensively on the stripping and testing of components: they are quick to learn this type of work.

More Power from the Ghost

The Continuing Development of Centrifugal Engines

With increased output, lower weight and a simplified handling procedure, the Ghost 105 makes possible notable improvements in Venom performance

REPORTING Engine Company activities in the past few years, the *Gazette* has been able at various times to dwell at length on the design outlook, laboratory research and subsequent development of a new range of gas-turbine and rocket engines. Representing the latest products that can be mentioned at the present time it is natural that the Gyron family of turbo-jets and the Spectre series of liquid-propellant rocket engines should have received some prominence in this journal, but it would be a pity if, in the publicity which invariably accompanies new and exciting projects, the Company's unceasing development of its earlier products was lost to view merely because their reliable operation in service had come to be accepted as routine.

It is, of course, the engine designer's task to foresee future needs and to make available at the correct time units of the right size, power and type, but it could be argued that, having done this, his task has only just begun. No less important is his duty to follow a design throughout its whole career, gaining the knowledge from thousands and even millions of hours of user-operation on which to base improvements. Further than that, he must be prepared to modify a sound basic design to keep pace with the demands for better performance and to utilise fresh knowledge. It is only by this means that an engine, and the aircraft to which it has been fitted, can be given an operational life of sufficient duration to justify

the original cost in terms of time and money. This becomes more significant as the growing complexity and higher performance involve greater outlay.

The de Havilland Ghost 53 Mk. 1—the Ghost 105 to quote its military designation—is the latest version of an engine which first ran on September 2, 1945. That engine in a civil form gave the world its first jet-engined passenger transport. The military version is to-day employed in many parts of the world. In the Venom single-seat fighter-bomber it serves the Royal Air Force and the air forces of Switzerland, Iraq and Venezuela; in the Venom two-seat variant it is employed by the Royal Air Force and the Royal Swedish Air Force for all-weather day and night defence; and it powers the Sea Venoms which carry out this vital function from the aircraft carriers of the Royal Navy, Royal Australian Navy and the French Navy.

In addition, the Ghost, which has been adopted by several European countries in the post-war years, has been constructed under licence in Switzerland, Italy and Sweden. It powers the Swedish Saab J.29 fighter which is in squadron service in large numbers in that country.

The Ghost 105 is basically similar to the earlier 103 and 104 engines and retains most of the design features of the earlier marks. It is, in fact, possible to convert some of the earlier engines to the 105 standard.

The improvements to be found in the new Ghost engine may be summarised as follows:—

Maximum power has been substantially increased.

Design refinements and the use of new materials have resulted in a useful weight reduction with increased durability.

Engine handling has been greatly simplified by the addition of an automatic maximum r.p.m. control.

Increased Power

The Ghost 105 delivers a rated thrust of 5,300 lb. which represents an increase of about eight per cent. over earlier versions. This advance has been achieved in two ways; the speed of rotation has been raised to ensure a greater mass flow through the engine and a higher gas temperature has been employed to speed up the jet velocity. The maximum r.p.m. for a 30-minute period is now 10,350 as compared with 10,250 on previous versions, and the mean jet-pipe temperature now permitted is 760°C. instead of the earlier figure of 700°C.

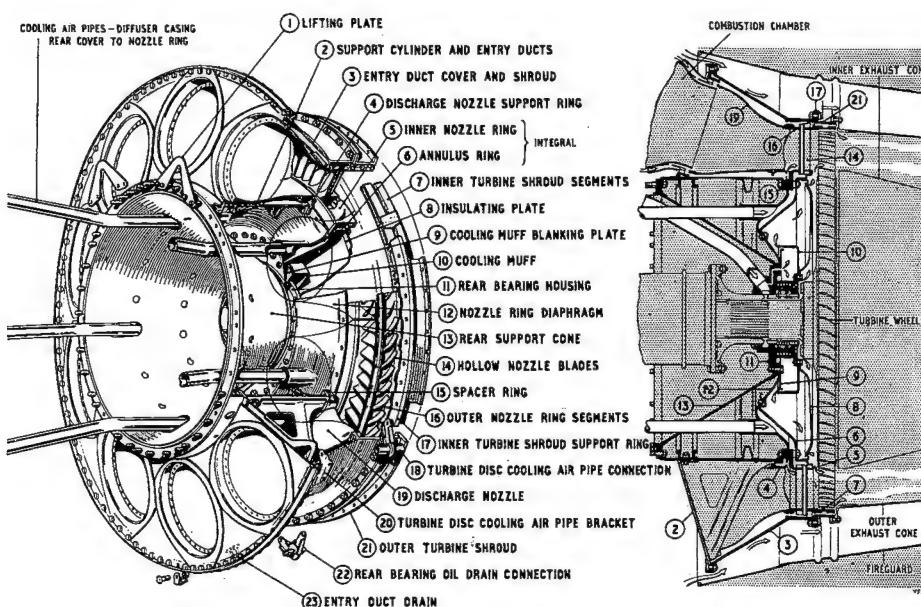
To cater for the higher temperatures now employed certain new design features have been incorporated. As can be seen from the diagram which illustrates the new turbine entry duct assembly, the Ghost 105 employs air, tapped from the compressor, to cool the turbine entry duct, stator blades, nozzle ring and turbine shroud. The hollow stator blades—a new feature in the Ghost—are made of Stellite 7 material using an investment casting process and are the outcome of many years of development of this type of blade and method of manufacture. The air-cooled nozzle junction assembly has been redesigned with load-free gas ducts which are allowed to expand freely within the rigid outer shroud. The inner member of the turbine shroud ring is now built in independent segments to permit free expansion with minimum distortion.

The de Havilland Ghost 105 employs a turbine disc which is now made in Rex. 448 material and has been redesigned to save weight. The turbine blades, originally of Nimonic 90 material, are now made in an improved Nimonic alloy. They have redesigned root serrations, and their method of location on the turbine disc has been simplified to make it possible to change blades in the field should this be necessary. Improved methods in design and manufacture have also resulted in interchangeability of turbine disc assemblies.

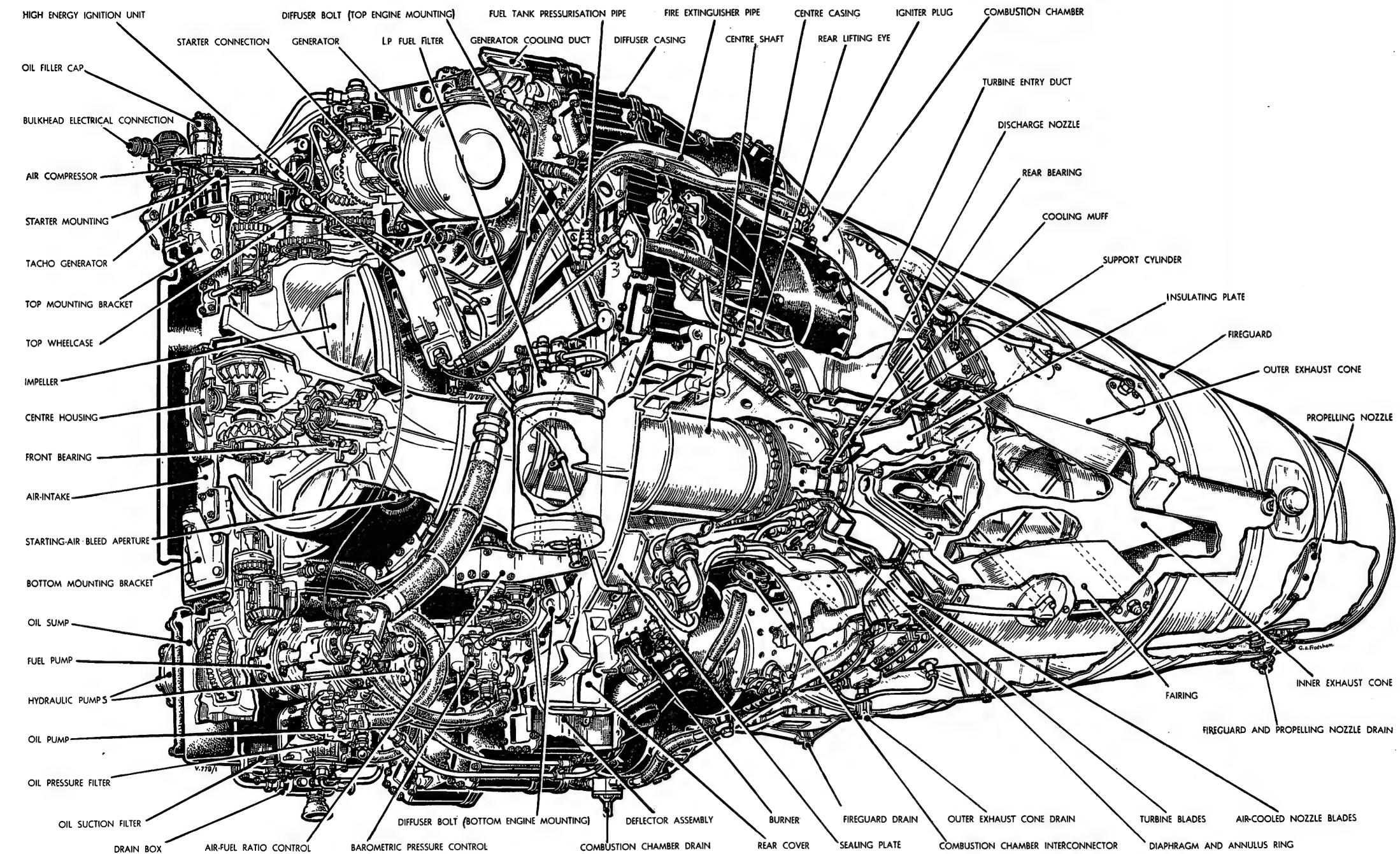
These new materials have been found to have much improved creep properties which are more than sufficient to withstand the greater operating temperatures and rotational speeds.

Weight Reduction

In addition to the new features already described (which although primarily incorporated to improve performance, have had some effect of weight reduction), the Ghost 105



This cut-away drawing of the redesigned turbine entry-duct assembly has been included to illustrate the new method of air-cooling. The unshaded portions of the right-hand diagram indicate the path of the cooling air. Whilst the rear-bearing cooling arrangement is similar to that on earlier Ghosts the five pipes leading air from the compressor to the turbine duct assembly are new. This air cools the inner nozzle ring, thence flows by way of the hollow stator blades to the outer nozzle ring and turbine shroud. Cooling of the new turbine entry ducts is improved by leading some of the secondary air from the combustion chambers between the entry duct and its shroud.



THE DE HAVILLAND GHOST 105 *A cut-away drawing*

benefits from certain modifications introduced for lightening purposes alone. Included in these is a saving of approximately 28 lb. which has been achieved by redesigning the rear hub of the impeller. Further reductions have been made possible by redesigning the flame tubes, by casting a new seal plate in a magnesium-zirconium alloy and the weight of the fireguard has been substantially reduced by using a 28 s.w.g. material.

The fuel system of the Ghost 105 is, in the main, similar to the Lucas system used on the 103, as distinct from the Dowty Spill-Flow equipment on the 104, but has been lightened and now employs a single Lucas "D" type pump.

Maximum R.P.M. Control

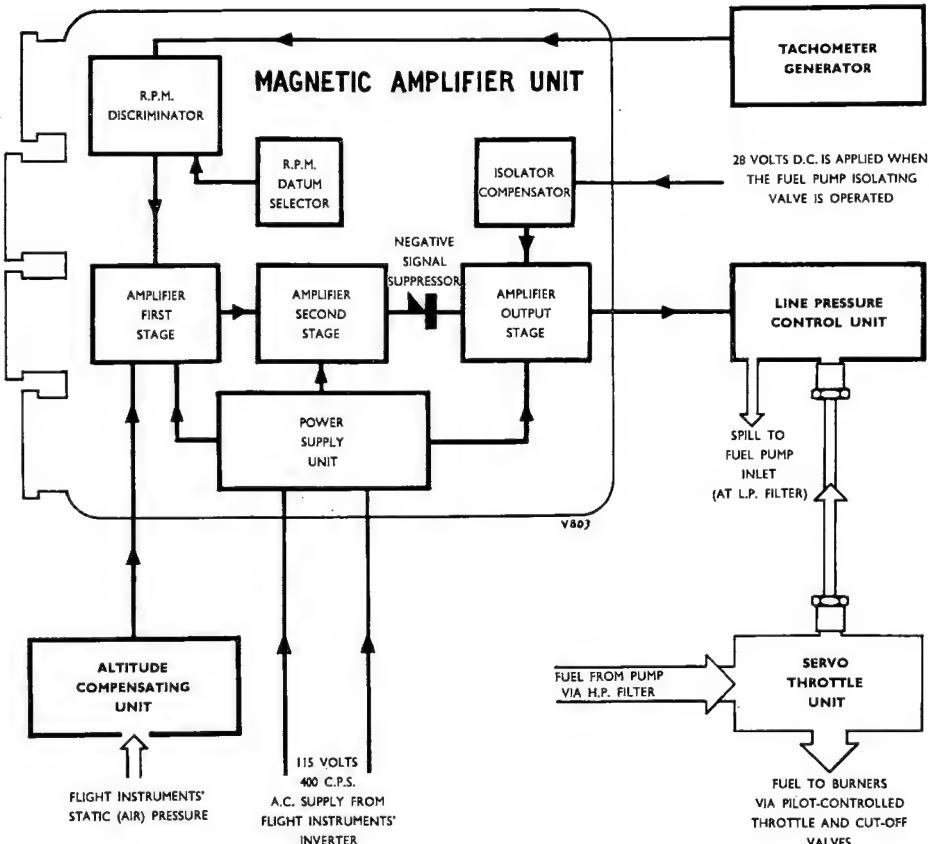
It is a characteristic of the normal jet engine fuel system that as altitude is gained a steady increase in engine r.p.m. and a resulting rise in jet-pipe temperature occurs when the throttle lever is allowed to stay at one position during the climb. In addition the jet-pipe temperature itself increases with a gain in altitude, even although the throttle is manually retarded to hold a constant engine speed. From this latter characteristic it follows that, for a given r.p.m., the jet-pipe temperature varies considerably with altitude. It could in fact be within limits at lower levels, for a given engine speed, and yet might well exceed the maximum permissible temperature at altitude.

Normal handling procedure until now has been to use the maximum permissible r.p.m. during take-off and initial climb and to reduce the throttle setting to keep the engine speed constant. The jet-pipe temperature is thus allowed to rise until a height is reached where it approaches the maximum permissible limit. At this altitude a throttle reduction is employed to reduce engine speed to a new figure with a subsequent drop in the jet-pipe temperature. This second engine speed, if held constant by continuous throttling back, ensures that the jet-pipe temperature, although increasing with further gains in altitude, will not exceed the permitted limit before the maximum operating altitude of the aircraft is reached.

It has always been felt that this procedure, causing as it does frequent reference to the engine instruments, unnecessarily burdens the pilot, particularly during combat when his attention is concentrated on other matters. Considerable development work has been put into an electrical device which eliminates this particular aspect of the pilot's task and allows him the same freedom from engine-handling worries as the automatic boost control and constant-speed propeller once afforded in piston-engined days.

Incorporated for the first time in a de Havilland engine is an automatic compensated speed-control system which ensures that the desired degree of control is exercised on engine speed and, therefore, temperature throughout all operating conditions.

Control of maximum turbine speed is effected by a reduction of the fuel flow to the burners. A solenoid-controlled servo throttle unit is arranged between the fuel pump and the manual throttle valve in such a manner that the application of a current to the solenoid increases the fuel pressure drop across the valve. The current required to operate this solenoid is derived from the tachometer generator which



A diagrammatic representation of the electrical maximum r.p.m. control.

provides an A.C. output of frequency and voltage proportional to the r.p.m. This output is applied to a speed discriminator and rectifier which produces two D.C. components, one proportional to the voltage and the other proportional to voltage and frequency. These D.C. components are in turn fed in opposition to a three-stage magnetic amplifier and by the adjustment of an r.p.m. datum selector they can be made to cancel at any speed desired. This, in the case of the Ghost 105 is 10,350 r.p.m. and at this balance point no signal is applied to the amplifier circuit; therefore no output passes to the solenoid.

At any speed above or below the selected balance point a signal is produced of corresponding polarity and of a magnitude proportional to the speed above or below the null point. Signals due to a drop in turbine speed below the null point are suppressed, but those arising from an increase in speed above that point are amplified and passed to the solenoid valve thus increasing the pressure drop across the servo unit and the turbine speed falls accordingly.

This system is in constant operation during take-off and the initial climb, maintaining the r.p.m. at its constant maximum permitted figure.

At approximately 23,000 ft. an altitude compensating unit which responds to variations in static pressure is employed to move the slider of a potentiometer. A D.C. voltage taken from the potentiometer slider, and which is proportional to the altitude, is fed into the amplifier unit. This current is again transmitted to the servo throttle unit and has the effect of gradually reducing r.p.m. to hold the jet-pipe temperature at its maximum safe figure at all altitudes. Whereas, in the earlier practice, the manual reduction of r.p.m. reduced the jet-pipe tempera-

ture in one large step and allowed it to build up slowly again, this procedure, when carried out by the automatic maximum-r.p.m. control unit, takes place in such a way that the maximum amount of power commensurate with jet-pipe temperature is delivered by the engine at all times.

At a time when various grades of turbine fuel are in use it is an important feature of this new system that the governing of engine speed, being controlled by an electrical installation which is sensitive to even small changes in r.p.m., is in no way affected by variations in fuel density.

The Ghost 105 incorporating this new type of throttle control has already been evaluated by both Royal Air Force and Royal Naval pilots, who comment most favourably on its operational usefulness. Quite apart from the advantages gained in handling technique during climb, there is the additional benefit that at any time during flight the throttle lever can be moved to the fullest extent of its forward travel without any risk of exceeding the engine's safety limits.

Having passed its 150-hour type-approval test in February of this year, the Ghost 105 engine is now in full production. Primarily intended as a replacement engine for the many Venom fighters which are now in world-wide operation, the new engine, with its increase of power and reduction in weight, endows these aircraft with improved take-off, higher rate of climb, and increased maximum level speed, and it permits a smaller radius of level turn at altitude. It has also restored the climb performance of the later marks of Venom all-weather fighter which suffered when a more comprehensive and therefore heavier radar installation was adopted for greater operational efficiency.

INSTRUMENT FOR INTERNATIONAL TRADE



This picture of the Comet 3, taken at Honolulu Airport on Decem'ber 13, 1955, as it taxied in after flying the 3,220-mile stage from Nandi, Fiji, in 6 hours 40 minutes, is offered as a Christmas-time reminder of the contribution which the Comet can make to the facility of trade between the producing and manufacturing countries of the world. Trade is the peacemaker.

ANTARCTIC EXPLORATION



Known as "Operation Deepfreeze," the United States contribution to the Geophysical Year Antarctic Survey is on a characteristically thorough basis. de Havilland Otters, here seen being unloaded from the U.S.S. Greenville Victory, form an important part of the large fleet of aircraft which are to be operated from the ice-strip in McMurdo Sound.

VAMPIRES IN SOUTH AMERICA



Vampires have long been in service with the Venezuelan Air Force and Vampire Trainers and Venoms have more recently been added to the strength. Vampires and Venoms are particularly well suited to operation in the mountainous terrain of Venezuela which calls for fighter-bombers with a high rate of climb and good manuevrability.

THE COMET 3

Important New Test Programme Planned.

By the time this issue of the *Gazette* is in circulation the Comet 3 development aircraft, G-ANLO, will be due to emerge from the workshop at Hatfield ready for a further programme of intensive test flying. The aircraft has recently been undergoing conversion and is now equipped with four Rolls-Royce Avon R.A.29 engines of the type which is to be fitted to the Comet 4 and the Comet 4A. These engines each develop 10,500 lb. of static thrust compared with the 10,000 lb. thrust of the Avon engines previously fitted. With the new engines the Comet 3 will conform very closely to the Comet 4 and development flying towards the Certificate of Airworthiness can be carried forward to an advanced stage.

In addition to the change of engines the Comet 3 has undergone a most unusual "operation": the wing has been cut short and two alternative sets of detachable wing-tips have been constructed. By this means the Comet 3 can, in a matter of hours, be made to conform to the 115-foot span of the Comet 4 or the 108-foot span of the Comet 4A. During the coming months many hours of performance measurement flying will be undertaken to determine the precise characteristics of both versions of the new Comet.



"The principal application is supposed to be rocket propulsion."



"On the contrary: thank you for a very smooth flight . . ."



"Oh, I see, it just wouldn't fly, eh?"

Punchinello and the Budgerigar

Does it pay to advertise?

THE annual agony of being funny faded into insignificance this year. Our chief, possibly having some theory about counter-irritants, but more probably being plain diabolical as usual, caused us to become involved in the advertising programme relative to our new product the Budgerigar biplane.

Our assurances that we were ethically and temperamentally opposed to the mere idea of advertising fell upon deaf ears. Announcing, with bald truth, that we had no training for, experience of, nor aptitude for, advertising, we met only a hurt expression and the queries—Had we no drive? Were we not inspired by the Budgerigar? Did we not, asked our chief tetchily, feel impelled to express in writing (and with pictures) its peculiar charm?

With shoulders pathetically bent we retired for luncheon; over the toad-in-a-hole we read all about Champagne Day at Porkkala, in *The Times*.

The Anglo-Danish Bacon Negotiations were entering their second phase when the prototype Budgerigar was wheeled out of the hangar for engine runs. Regarding it morosely we sought in vain for catchy little phrases which, within a maximum of five simple words must, said our chief, inform the reader fully of the payload carriageable over a typical stage length, the number of seats (standard version), cruising speed at 60 per cent. M.E.T.O. power (with altitude stated) and the salient details of its engines, propellers, and the D.H. world service organisation.

Moved by an appeal for the provision of Sunday Dinners for Sheep Dogs, and after noting that the Civil Servants had Opposed Transfer Plans, we trotted into our chief's office clutching a piece of paper upon which we had written "Budgerigar Offers Six-Engined Security". But what, asked our chief, about the cunning little sun-blinds, the light-weight onyx ashtrays, the nylon-embroidered cushion on the co-pilot's seat? Were we making no attempt to appeal to the travelling public?

Heartened by a printing dispute which raised our hopes of having no Christmas *Gazette* to be funny for, we threw ourselves with renewed energy into the task of preparing material suitable for getting the Budgerigar into the public mind and the foreign press. We had a picture painted showing the aeroplane rising proudly from a bank of strato-cumulus, with delightful effects of sunshine on polished aluminium. The drawing office informed us that production aircraft would be supplied with all surfaces coated with matt paint. Our chief remarked curtly that the picture did not sell the bad-weather qualities of the Budgerigar.

We listened to a radio programme in the course of which it was pointed out that a number of eminent Victorians had carried out enormous amounts of administrative and literary work whilst remaining in bed. We said that we had a strong Victorian streak in our nature but the hint was received coldly by our chief; we were compelled to

continue in the office our attempts to be funny and inspired.

Anxiety about Witchcraft and a pile-up of Butter were reported from Buganda and Victoria respectively. The back brake-cable of our hard-working vehicle broke in the Finchley Road.

Shortly after its first flight we had a photograph taken of the Budgerigar taxying along the perimeter track in the pouring rain. A horizontal wind sock bore mute witness to the howling gale which was in progress at the time. Our chief,

sighing over a large glossy print of the photograph, stated flatly that over his dead body would that appear in *Aviation Week*.

Russia was reported to be taking part in Talks on the Standardisation of Boilers in Madrid; there were Further Developments in the Pond Dispute at Moreton-in-Marsh. The Ottawa Hansard was Tampered With, there was Triumph at the Scottish Dairy Show, and the Higher Fish Levy was postponed.

The Budgerigar went to French Togoland for humidity trials. We produced an informative little ad. intended to appeal to the executive market and describing, with such lyricism as we could muster, the low operating costs, the supreme comfort and the sturdy reliability of the Budgerigar. Our chief complained that we had included no hint of the aircraft's brilliant future as a navigational trainer.

The Darwinian Dogma was Challenged.



and hushpuppies. The cupboard in our kitchen fell down unexpectedly, demolishing several spare fish-tanks, a number of beer-bottles and a small crate full of eggs.

Our chief said what about that dignified full-page ad. for *The Illustrated London News*?

Farnborough began to loom.

A man was escorted from the room during a meeting of the disciplinary committee of the Tomato and Cucumber Marketing Board in London.

We submitted to our chief during Farnborough week a layout for the dignified full-page ad. for *The Illustrated London News*. Our chief criticised. What, he asked, could have caused us to forget the need to appeal to the simple peasantry of Africa? Did we not realise that the Budgerigar had been designed expressly for route-pioneering in the undeveloped lands?

The front brake-cable of our hard-working vehicle broke in the middle of Woking.

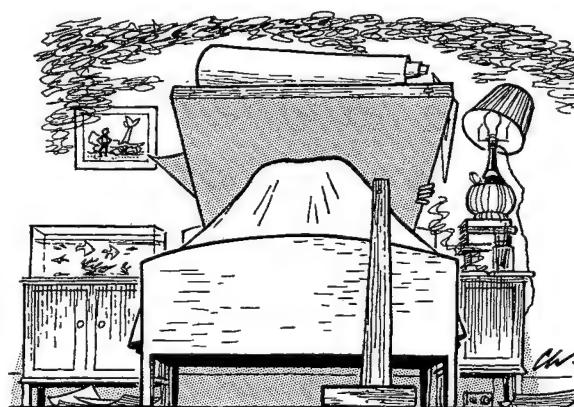
Interest in the new Brazil Cabinet was locally overshadowed by the concern over the opening of a fried fish shop in the middle of one of our more reactionary Hertfordshire villages.

The Budgerigar went to Alaska for Arctic trials, and there was no more photography for the time being. We were implored by our chief to be urgently funny for Christmas. The floors of the offices occupied by some of our senior aerodynamicists started coming up in waves.

The Chinese Press went Horizontal.

A headline "Pilots' Attitude Hardening" proved to be a reference to the Suez situation, not to the rigours associated with Tiger Moths.

Our chief asked us coldly what plans we had made to counter the advertising campaign relative to the Budgerigar's new competitor—the Cessna Canary. Our suggestion of "de Havilland Budgerigar—Cheep, Cheep at the Price" was not approved.



"A strong Victorian streak in our nature"

Searching furtively through the American journals in the hope of finding catch-phrases suitable for adaptation to the executive version of the Budgerigar, we found our attention distracted by editorial references to boondocks

POWER FOR THE VANGUARD



Power for the Vickers Vanguard, 20 of which have been ordered by B.E.A., will be supplied by four 4,220 h.p. Rolls-Royce Tyne turbine engines fitted with de Havilland propellers of 14 ft. 6 in. diameter. The propellers, specially designed for this installation, incorporate a number of new features which have been developed to provide the highest possible degree of safety and comfort for passengers in the Vanguard. The initial flight-testing of the engine and propellers is being carried out with the power unit mounted, as shown in this photograph, in the nose of an Avro Lincoln aircraft.

RETIREMENT OF MR. F. T. HEARLE *continued from page 191*

business had got into full swing, and Mr. Hearle helped the system forward with characteristic energy. Now, late in 1956, the School numbers some 2,900 apprentices, and in Mr. Nixon the Education Board has an equally enthusiastic Chairman.

Mr. Hearle's love of books and pictures, which was always fostered by his wife (Sir Geoffrey's sister) during her lifetime, has shown itself in many ways, and her influence is to be observed in the de Havilland library, which he inaugurated at Hatfield during the war and which has several factory branches to-day.

Striving to sum up an individual who has had such a strong influence upon the character of the de Havilland organisation, the *Gazette* once said that the outstanding thing about Frank Hearle has been his combination of benign and open friendliness with the harder qualities necessary in industrial organisation. It is true that he has always been a strict disciplinarian and a firm leader, but to us he is above all a lovable gentleman, a humorous and happy companion, and a man who just cannot make an enemy.

PROPELLER COMPANY APPOINTMENT



A new appointment has been made within de Havilland Propellers Ltd., which further strengthens the engineering staff engaged on guided weapon contracts. Mr. J. E. Blazeby, who has been the Company's chief draughtsman since 1947, is appointed Assistant Engineering Manager (Guided Weapons).

Mr. Blazeby was educated at the City of Norwich School and the City of Norwich Technical College. After serving his engineering apprenticeship with Messrs. Laurence, Scott & Electromotors Ltd., he was employed by that Company as a designer, and later as a sales and estimating engineer. In 1939 he joined the Aeronautical Inspection Directorate of the Air Ministry, and was subsequently transferred to the Directorate of Aircraft Production for work on the installation of American Wright aero-engines into Short Stirling bomber aircraft.

Mr. Blazeby joined de Havilland in 1944 as Chief Draughtsman of the Test Rig and Tool Drawing Offices of the Propeller Engineering Division, then at Stag Lane, Edgware, in North London. In this capacity he was the Company's engineer in charge of the erection of the propeller test tunnels and the spin-rig house at Hatfield. In 1947 he was appointed Chief Draughtsman of all the Company's drawing offices.

In his new capacity Mr. Blazeby will be responsible for the general engineering management of the Guided Weapon activities upon which the Company has been engaged since 1951.

AIR BUS IN INDIA



The Heron takes the same place in the lives of the people of a score of countries as the Green Line bus takes in the lives of Londoners. Among those countries where air travel is valued especially, because of the difficulties associated with surface transport, is India, where Herons serve the local routes, based on Delhi, of Indian Airlines Corporation.

THE NELSON TOUCH AND GO



Deck-landing trials of the D.H.110 all-weather interceptor have been carried out on Her Majesty's aircraft carriers Albion and Ark Royal. This photograph showing an approach onto H.M.S. Albion was taken during the touch-and-go trials. Fully arrested landing-on and catapult take-off trials were successfully carried out during the Spring of 1956 and the aircraft is now being put into full production for the Royal Navy.

EXPORT DOVES



Many de Havilland Doves are being operated as private and executive aircraft in the United States, where the number of hours flown each year on pleasure and business exceeds that achieved by the scheduled airlines. de Havilland sales and service in the U.S. are administered by de Havilland Aircraft Inc., based at La Guardia Airport, New York.

BABY JANE

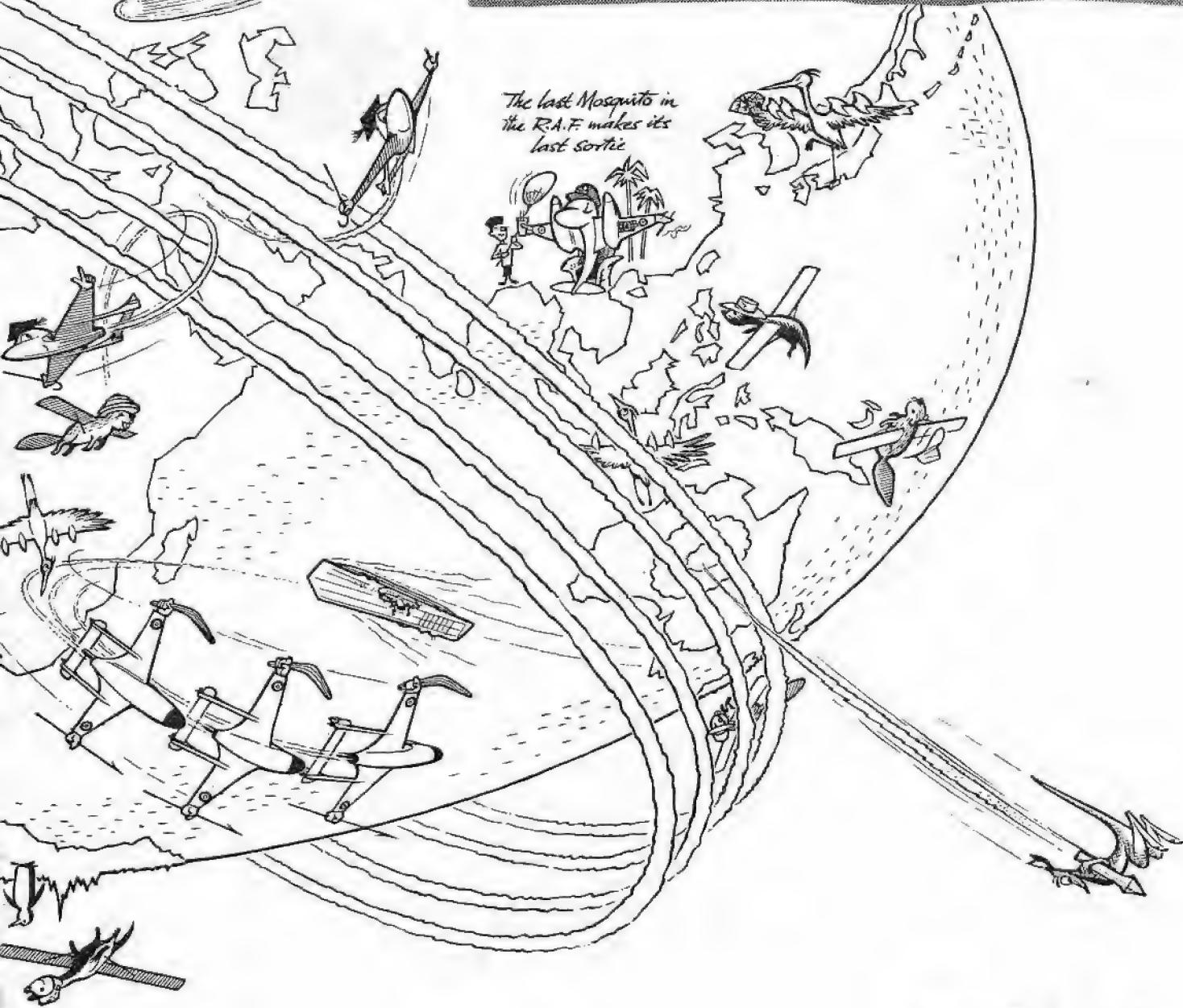
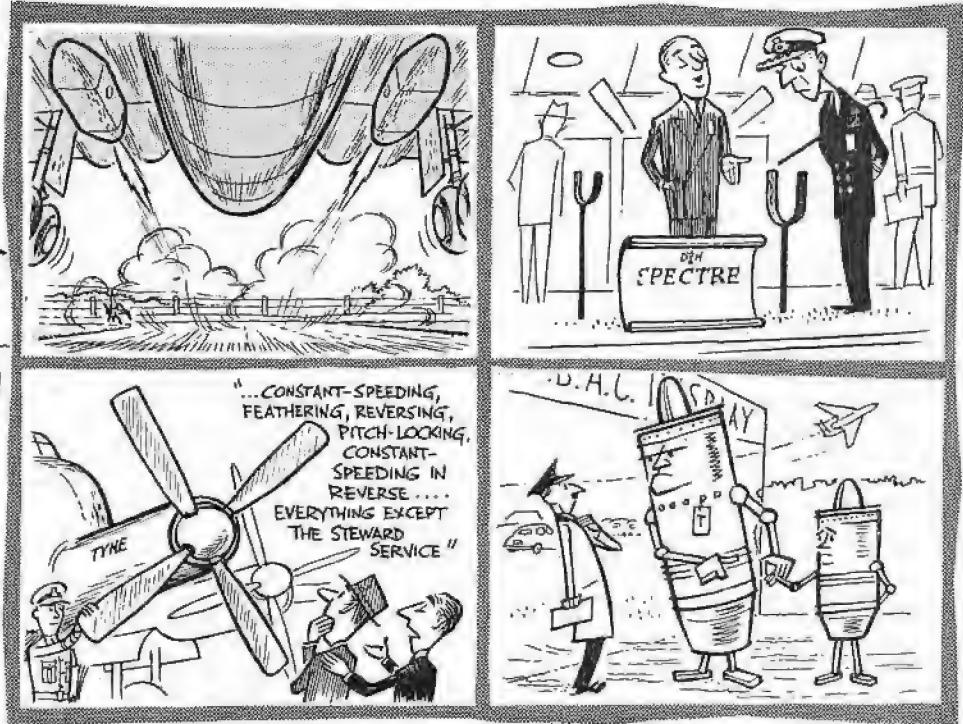
From the house of Sampson Low, Marston & Co., the publishers of Jane's "All the World's Aircraft," comes a handy volume, "The Dumpy Book of Aircraft and the Air." Although perhaps primarily directed towards the younger generation, the Dumpy Book is in fact a mine of information for those of any age who require a ready reference to matters aeronautical.

The scope of the book is wide: it contains over 1,200 illustrations, a large proportion of which are three-view general arrangement drawings of current aircraft in a variety of categories. Other interesting features are a profusely illustrated history of aircraft design, particulars of the world's international airline companies, brief histories of the Royal Air Force Squadrons and four chapters dealing with aero engines of every type. Other illustrated features include Royal Navy and Royal Air Force Squadron badges, aircraft carrier deck plans, and international markings of service aircraft.

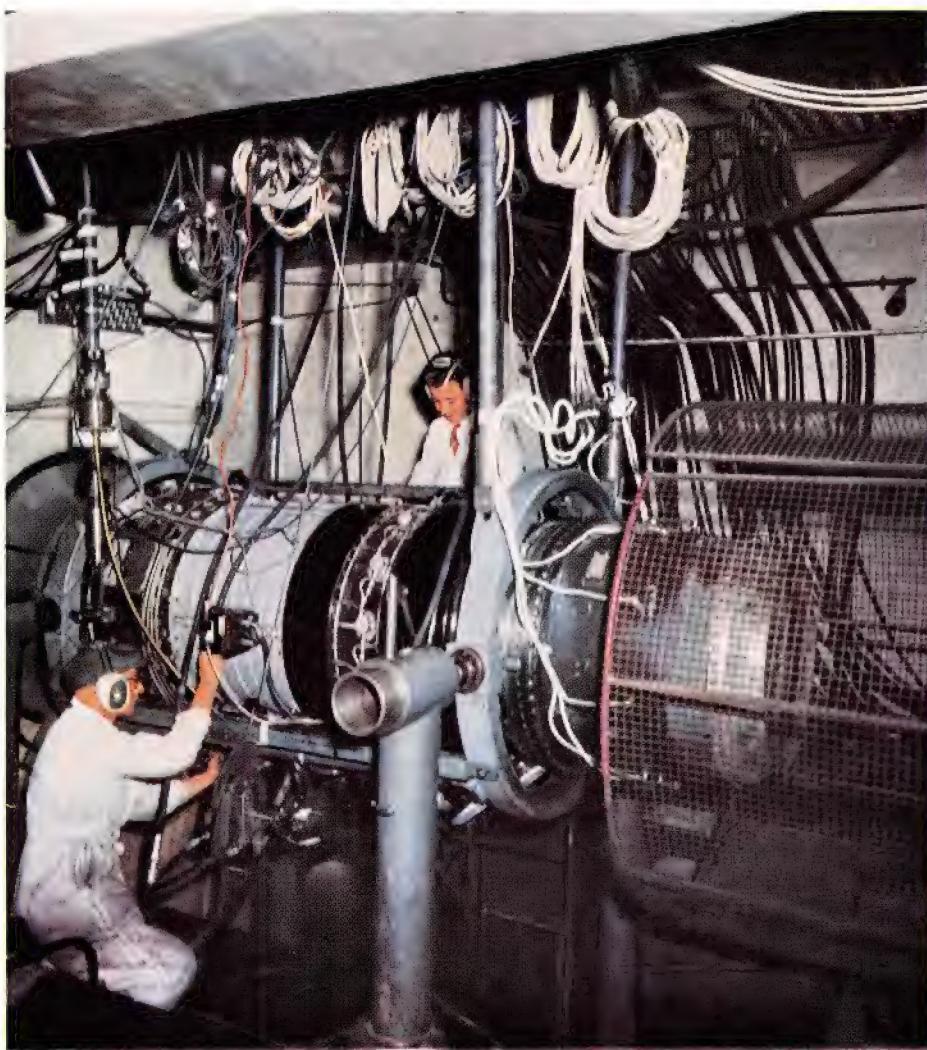
At 3s. 6d. the Dumpy Book is excellent value for money and is well worth the small space that it will occupy in any aeronautical reference library.



THE YEAR HAS FLOWN



COMPACT POWER



The de Havilland Gyron Junior turbo-jet, the latest of the de Havilland family of engines designed for supersonic flight, is here seen on the testbed. In addition to its strategic role as the power plant of high-level interceptors the Gyron Junior has an important application in the Army close-support aircraft operating at lower speeds and altitudes.

* * *

MORE DOVES FOR THE MIDDLE EAST

Order for six placed by Iranian Oil Consortium

The Iranian Oil Consortium has placed an order for six de Havilland Dove light transport aircraft for service in the Middle East. The Doves, which will be of the eight-seat Series 5 version, will be delivered towards the end of this year.

The activities of the international Consortium, which is made up of British, Dutch, French and American interests, are generally well known and consist of the management and development of the Iranian oil fields around Abadan. The Doves will be operated on regular services for the conveyance of staff between the refinery centre at Abadan and the various oil fields situated in the foothills of the Zagros Mountains, approximately 120 miles north east of Abadan.

Nearly 500 Doves are in service; of these a fair proportion are in the Middle East. Present civil operators there include Gulf Aviation, Iraqi Airways and the Iraq Petroleum Company.

RETIREMENT OF MR. BRIAN WALKER



Test pilot with D.H. Australia for ten years.

An informal luncheon, followed by the presentation of a silver salver as a token of appreciation by the directors of D.H. Australia, marked the recent retirement from test flying of Mr. Brian R. (Blackjack) Walker. He had been chief test pilot at Bankstown for 10 years.

Brian Walker was born at Lyndoch, South Australia, in 1913 and was educated at the Collegiate School of St. Peter in Adelaide. He joined the Royal Australian Air Force in 1935 and held the rank of Flight Lieutenant at the outbreak of World War II. He served with distinction in Darwin, New Guinea and adjacent islands, and was awarded the D.S.O. He was demobilised in 1946 with the rank of Group Captain.

Mr. Walker has flown over 7,000 hours in 70 different types of aircraft. He was responsible for the test flying of the Vampire fighters and Trainers built by D.H. Australia since the war.

In the accompanying photograph Mr. Walker is seen (right) with Major Murray-Jones, Chairman of de Havilland in Australia.

VALIANT TAKE-OFF



A Vickers Valiant bomber taking off with the assistance of two de Havilland Super Sprite liquid-propellant rocket engines. At a height of about 700 feet these units, which are mounted on standard bomb-release mechanism, are jettisoned. A system of parachutes and an inflated landing-bag ensures that the Super Sprite is undamaged and ready for immediate use.

SEA VENOMS IN THE ANTIPODES



The Sea Venom Mk. 53, now in squadron service, is the first jet aircraft to be operated by the Royal Australian Navy. The Australian equipment and operating technique are closely co-ordinated with those of the Royal Navy and the squadrons of both forces can operate with equal ease from each other's carriers and bases.

GUESS WHAT



This enormous aeroplane, seen at the D.H. Canada base at Downsview, Toronto, is a Globemaster of the United States Army Transport Command. It was not built by de Havilland; it has neither D.H. engines nor D.H. propellers. When this picture was taken, however, it had a D.H. product inside its inside. To find out the nature of the Globemaster's load, see the photograph on page 211.

Don't
be unemphatic
ask for
Hydromatic

The First Manufacturers
of variable-pitch
propellers in
Great Britain



The smooth
Pitch-change
in the
ROUND dome



smoothness you look for
A good propeller is rather like a good
cutting-green. It is a blend of many single
components. And, like a sward is a mixture of
propeller must above all be smooth, or
round', to use the technical term. Then
there is no finer means of propulsion. Then
The smoothness you enjoy in
de Havilland propellers is due to the skill
selected single parts in perfect harmony.
That is why there is no finer propeller.
DE HAVILLAND PROPELLERS

DE HAVILLAND PROP.

Flying in an aeroplane fitted with
de Havilland Propellers fills you with
the joy of living but never leaves you
liverish. Try it today!

PROPELLER ADVERTISING RE-STYLED
Would our advertisements be more effective
if we emulated the experts?

John Haig

By courtesy of:

Johnnie Walker

Dubonnet Aperitif Persil Soap Powder
Parker Pen Co. Ltd.

Group-Captain Julian
Ffooley-Pheathard,
D.S.O. (and two bars),
gave his wife, the Hon.
Constance Spede, a
de Havilland propeller
for Christmas

MY ELDERLY AUNT
**Ma tante âgée
maintient
que les trois
éléments d'aviation
sont une chaise longue,
les hélices de Havilland,
et point d'imagination**
*MAINTAINS
THAT THE THREE
ESSENTIALS OF FLYING
ARE AN
ARMCHAIR,
DE HAVILLAND PROPELLERS,
AND NO IMAGINATION AT ALL.*
Elle a raison!
*SHE'S
RIGHT!*



With many thanks and much
affection to my wife and
myself, and to our
children, we are very
much obliged to you.

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MORE OTTERS FOR THE PHILIPPINES

With the recent purchase of three additional Otter transport aircraft from de Havilland Aircraft of Canada, Philippine Airlines (PAL) plan to double the scope of their feeder-line activities in the remote rural regions of the islands. Delivery of the first of the new aircraft was made on August 30. The second was delivered towards the end of September and the third around the middle of October. These additions to the PAL fleet of Canadian designed and built Otters will extend the scope of PAL feeder-line operations to a further 17 "off the beaten track" communities to bring the total of communities thus served to 35.

Prior to June 15, 1955, the remote rural regions of the Philippines were almost inaccessible to the casual traveller and for the business man or farmer, whose callings necessitated trips into and out of these areas, they presented a time-consuming, soul-wearying prospect.

On June 15 of that year, Philippine Airlines (PAL), inaugurated a feeder-line service in these remote regions using three D.H. Otters. This feeder-line operation was intended to be primarily a public service and airline officials had anticipated operating it at a loss. For this reason their requirement was for aircraft that combined economy of operation with a high safety factor. Because landing and take-off facilities on the planned routes would, in most cases, be short, narrow improvised strips the need was for aircraft with short take-off and landing ability yet providing the maximum possible load capacity. After careful consideration the PAL officials decided that the Canadian-built Otter met these requirements.

Over the 15 months that have elapsed since the PAL Otters first went into operation, their performance has proved the Philippine Airlines' choice of Otters for their feeder-line service was a wise one. With a daily utilisation rate of better than three-and-a-quarter hours, the Otters, contrary to company expectations, have shown a substantial profit for their first year of operation. Yet the cost to the customer has been almost negligible. The traveller from Buenavista to Gingoog now pays nine pesos to fly over the route that cost forty pesos by bus and his travel time is cut from five hours to 20 minutes. Travellers who formerly spent a week travelling from Bislig to Davao by coastal steamer now make the same journey in less than an hour.

These are but two examples of the time-and-money-saving aspects of PAL feeder-line services in the Philippines. To many of the hinterland inhabitants, the Otter is indeed a twentieth century magic carpet.

DE HAVILLAND AND SAUNDERS-ROE

A valuable integration

On November 5, 1956, as we closed for press, it was announced that de Havilland Holdings Ltd. of Hatfield, Hertfordshire, England, had acquired an interest in Saunders-Roe Ltd. of East Cowes, Isle of Wight.

This association between the parent companies of two groups, each of whose activities covers a wide range of products, will afford a valuable integration the effect of which will be felt primarily in their marketing efforts, especially overseas.

DEPUTY CHAIRMEN

*Mr. A. F. Burke and
Sir Ralph Sorley.*

At October meetings of the Boards of Directors of The de Havilland Aircraft Company Ltd., and de Havilland Propellers Ltd., at Hatfield, the Managing Directors of these companies, Mr. A. F. Burke and Sir Ralph Sorley respectively, were appointed Deputy Chairmen. The Chairman of each company is Mr. W. E. Nixon, who also is Chairman of the parent company, de Havilland Holdings Ltd.

A NEW PROPELLER COMPANY DIRECTOR



Mr. A. S. Wheate, C.A., who has been Secretary of de Havilland Propellers Limited since April, 1952, is appointed a Director of the Company from October 1, 1956.

Mr. Wheate was educated at Hillhead High School and Glasgow University. He commenced his articles with Wilson, Stirling & Co., Chartered Accountants, in September, 1938. This training was interrupted by the war and in May, 1941, he left to join the Royal Armoured Corps. After training at Sandhurst he was commissioned into the Lothian and Border Horse and served as a tank officer in the European theatre of operations. Upon demobilisation in September, 1946, he returned to Wilson, Stirling & Co. for a further 12 months and qualified as a chartered accountant.

Mr. Wheate joined the de Havilland Aircraft Co. Ltd., in September, 1947. His first 18 months with the Company were spent in the business, personnel and production departments, studying de Havilland organisation and methods: this initial period included four months at Chester whilst he assisted in taking over control, from Vickers-Armstrongs Ltd., of the Broughton factory which to-day handles the major share of de Havilland aircraft production. In March, 1949, he became Assistant to the Secretary of The de Havilland Aircraft Co. Ltd.

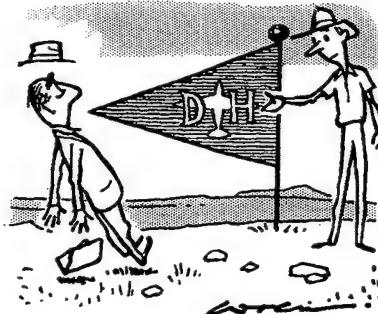
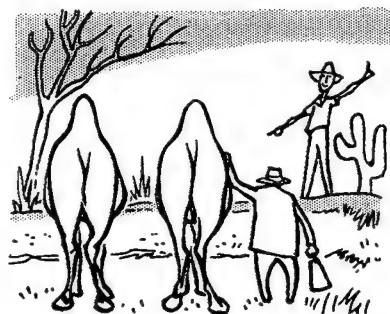
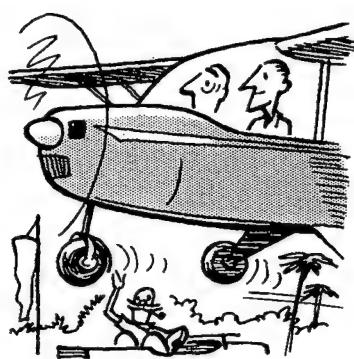
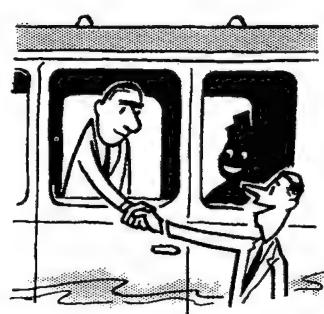
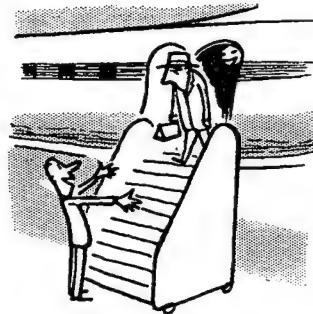
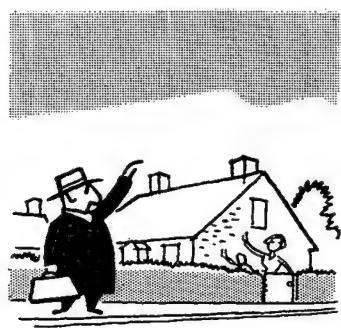
Mr. Wheate was appointed Secretary of de Havilland Propellers Ltd., in April, 1952, and has thus been responsible for the financial administration of the Propeller Company during a period in which it has trebled in size. He joins the Board at a time when the full development of existing resources, and those yet to be brought into use, should lead to an increasing scale of business in the coming years.

WHAT THE GLOBEMASTER DISGORGED



This L.20 Beaver, a mere feather to the Globemaster (capable of carrying over 22 tons) was being delivered at Downsview after a flight of 10½ hours from Bluie West. Object of the exercise? Overhaul of Beaver.

FAR FLUNG





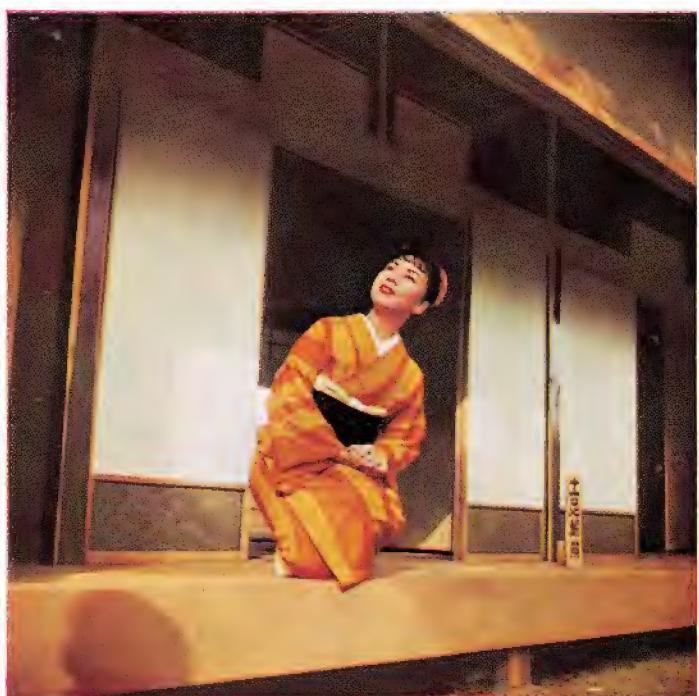
Colour wood-cut printing is one of the classic arts of Japan, and this example was executed by Hiroshige about 120 years ago. Is one of a series of 53 "Stages of the Tokaido" illustrating the old highway from Yedo (to-day known as Tokyo) to Kyoto, the cultural capital of Japan. The once laborious Tokaido pilgrimage can be made by Dove or Heron on to-day's scheduled services. Modern convenience has displaced ancient charm, but the traveller arriving by de Havilland feeder-liner can still look out from an inn window and see the Sanjō Bridge spanning the beautiful stream of Kamogawa.

de Havilland in Japan

SINCE the war there has been a steady flow of de Havilland products into the islands of Japan. One of the more difficult stress-concentrations in the world's economic shell is that which exists between Britain and Japan. Although the two countries could hardly be further apart geographically and could hardly differ more widely in the superficial aspects of manners and motives, there is beneath the surface much to be found in common between them. They are two maritime island peoples who look at life from a strongly traditional point of view and whose living standards depend largely on world trade and the carriage of the world's goods.

The competition resulting from these facts is inevitably fierce; but to-day it is mellowed by the series of annual trade agreements in which each side recognises the vital needs of the other. Foundations for a co-operative future, as the only alternative to ruthless and senseless competition, have been laid. The aircraft industry, offering undeniable technical leadership, is a field which enables air trade with Japan to expand without head-on collisions of the type which the textile world faces. We in de Havilland believe, therefore, that in striving from ordinary reasons for ordinary business we are also helping the universal instinct for good human relationships to get on top of cold economic facts.

A Japanese house derives its charm and beauty from traditional simplicity, delicate proportions, and the loveliness (unfamiliar to Western eyes) of bare, unpainted wood. The charm of Japanese womanhood is also traditional, if sometimes misreported in its details. We do not know the who or the where or the when of this attractive picture; in fact all we know is that the sign says "Please take your boots off."





Three Herons and one of the Doves of J.H.A.T. mingle with intercontinental traffic at Tokyo's Haneda Airport. This picture was taken before the new terminal buildings were opened; domestic and international traffic are now separated.

Japan's Domestic Airlines

The island chain of Japan is well suited to the aeroplane as a transport vehicle, but other factors exist which reduce the potential scope of domestic airlines. Surface transport is good; coastal and ferry vessels operate intensive highly developed services and although the roads are very poor the railways are both cheap and outstandingly good. Fares are necessarily low, because of the competition of the railways, because of a damaging "transportation tax" on every ticket, and because income levels are low. Fares must be kept within public reach.

These difficulties weigh less seriously with the major national operator, Japan Air Lines, who run DC.4's and DC.6's on the backbone route through the islands. Sixty to eighty passengers (and Japanese airliners, like all other vehicles, seem to be always full) can put an operator into the black even when fares are unusually low; but with the smaller aircraft the problem is much more acute. Great credit is therefore due to the airlines operating Doves and Herons for the considerable successes they are achieving. The aircraft are popular and have carved out

their own place in the travelling public's affections. Their regularity record is high and the utilisation on both day and night services is amongst the highest in the world for aircraft in this class.

The operations by Japan Helicopter and Aeroplane Transport are achieving a 90 per cent. load factor, often in direct competition with large airliners, along the national trunk routes of the chain, from Hokkaido in the north to Kyushu in the south.

Far East Airlines, based at Osaka and operating in the main to the southward, have somewhat less rewarding routes except during the holiday season, but the past year has seen substantial traffic increases throughout the network. Both companies share a night-mail contract between Tokyo and Osaka, which is in itself a small epic of flying achievement over a route where terrain is always, and weather often, hostile to the aviator.

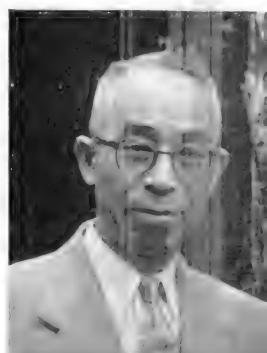
Special equipment installed in a chartered Heron during a meteorological research programme conducted by the C.A.B.



The reservation counter of Japan Helicopter and Aeroplane Transport at Haneda. The new airport is contemporary with London and embodies many of the same principles of passenger handling and reception. As the Japanese are inveterate sightseers the arrangements for the rubber-neckers are particularly comprehensive.



Mr. Shiochi Mitoro is President of J.H.A.T., an appointment which he took up in December, 1952. He had previously been Managing Editor of "Asahi," the leading daily newspaper which is traditionally prominent in aviation and which sponsored the round-the-world flight of the "Kamikaze" (Divine Wind) in the 'thirties.



Admiral T. Nakamura is Managing Director of Far East Airlines, whose D.C.3, Marathon and Dove operations are based on Osaka, the Glasgow of Japan. He has a distinguished record as an Engineering Officer in the Japanese Navy and since the war has been closely associated with Japan's civil aircraft procurement plans.



Passengers embark in a Dove of Far East Airlines of Itami Airport, Osaka. The individual window seats, excellent view on highly scenic routes, and lower fares combine to win good traffic from competing 60-seaters. Itami is one of several civil airports which are also U.S.A.F. bases, and civil operators' costs are raised artificially by stand-off times incurred while fitting into the jet-fighter pattern.



Young girls dressed in the distinctive costume of the island of Oshima take their first flight in a J.H.A.T. Dove. National dress is not a quaint survival in Japan but a normal part of daily life, seen even in the department stores and subways of the big cities.

Continuous lines on this map indicate routes at present served by Dove or Heron operators. Broken lines indicate routes which are envisaged for Doves and Herons under a development plan likely to be implemented over the next three years. Other place names refer to centres mentioned elsewhere in these pages.



The Doves operate a night airmail schedule between Tokyo and Osaka in addition to their daytime passenger flights, so that utilisations are maintained at a high level.





Japan's Air Defence

Post-war rearmament in Japan has two conspicuous features. First, the early civilian control imposed by the then Prime Minister Shigeru Yoshida has remained to this day. Secondly, the written constitution which Japan adopted after the war contains a clause, which many Japanese consider ambiguous, relinquishing the use of force in settling international disputes. From this the constitution goes on to declare that land, sea and air forces will never be maintained. It has, however, been argued that the latter part of this article is contingent upon the first part being interpreted as referring to the use of aggressive force and therefore does not preclude Japan from maintaining armed forces sufficient to protect her own shores. Thus, pending constitutional revision, which the Japanese Diet's present temper makes improbable for the immediate future, a number of sobriquets are used to describe what we would call simply the Royal Navy, the Army, and the Royal Air Force.

The present National Defence Agency came into being in July, 1954, and comprises Ground, Maritime, and Air Self-Defence forces. However, the first overt rearmament had taken place in July, 1950, when a lightly-equipped, America-encouraged militia known as the National Police Reserve came into being. Two years later the National Safety Agency was formed from this nucleus, and to the land element was added a naval force founded from the old Coastguard Service, which had been allowed to continue without a break from the time of the surrender.

Thus the Japanese Air Force is the youngest of the three services and it is indeed the first

time that Japan has possessed a separate air arm. Those officers and men with service in the pre-surrender forces have therefore a naval or a military background. Since friction between the former Imperial Japanese Navy and the Army is well known to have existed, it is greatly to the credit of the present senior Air Officers that the Air Force is to-day welded together so well and possesses such an easily discernible *esprit de corps*.

The Air Force is equipped under budgetary allocations which are spent with Japanese manufacturers, and on the Japanese share of the cost of equipment delivered under Mutual Security Assistance grants. The backbone of the present force is provided by F.86 and T.33 aircraft, but a very active experimental squadron exists. It is this squadron that is using the Vampire Trainer.

The preponderance of American troops in the occupation force, their continued stay in Japan as Security Forces when other allied nations' components had withdrawn, the abundance of American equipment and stores of all descriptions, coupled with America's immediate concern over security in the Pacific, have created a situation in which Japan's armed

forces are to-day to all intents and purposes American in concept. It will be interesting to observe the course which will be followed in the future, bearing in mind the fact that the role of the Japanese defence force is entirely different from that of her sponsors, and that Japan has a long and mature military history, and that her resources and her national economy and her geographical problems are closer to those of the United Kingdom than those of any other country.

For the present, supreme command of the National Defence Agency is exercised by the Prime Minister through a Director-General (Mr. N. Funada, who has Cabinet status) and the Joint Staff Council. The J.S.C. is at the level at which uniforms appear and comprises a Chairman (Lieutenant-General K. Hayashi, formerly of the Home Ministry), Army member (Lieutenant-General T. Tsutsumi), Naval member (Vice-Admiral H. Nagasawa) and Air member (Lieutenant-General S. Sanagi). Below the Joint Staff Council come the usual chains of command. There is also a National Defence Committee which has no direct authority but, consisting of national leaders in all fields of

General Genda prepares for a high-altitude Mach limitation check with Mr. George Errington. The General remarked that this was perhaps the first time that a Vampire's crew could claim to share more than one hundred years — one hundred and six to be exact.





Lieutenant-General S. Sanagi makes a contribution to the Olympic Games fund. He is Chief of Air Staff, N.D.A., and held the wartime rank of Captain in the Imperial Navy. At the end of hostilities he was Senior Staff Officer, South East Fleet, Rabaul. After the war he remained in Rabaul for three years in connection with the legal defence of alleged and proven war criminals in the area, and more recently has been intimately concerned with each stage of the re-creation of Japan's air defence. Also in the picture is Lieutenant-General M. Abiyama, Deputy-Chief of Air Staff.

endeavour, acts in an advisory capacity to the Prime Minister.

The strength of the Air Force to-day is probably 20,000 all ranks, but this will expand with the development of the present plan to maintain 1,200 fighters. In accordance with the essentially defensive national policy, no bombers or carrier-borne aircraft are at present envisaged.

The Japanese aircraft industry, which at the peak of its war effort was producing numerically more aircraft and engines than the United Kingdom, was eventually prostrated by bombing and by the ordinances of the Occupation. After lean but courageous post-war years the main structure of experienced management appears to have survived the effects of a decade devoted to bus-bodies and motor-cycles. Technical teams are re-forming and re-informing themselves and the first-fruits are appearing. Fuji Heavy Industries, once a major producer of radial engines under the famed name of Nakajima, have recently been awarded a contract for a swept-wing jet trainer, and a

transonic fighter project will be awarded shortly within the industry. World-known names like Mitsubishi and Ishikawajima are again active in the creative fields as well as in the immediate production of licensed defence equipment. To make a fresh start in the aircraft industry at its present level of complexity is a task about which the Japanese have no illusions, but they are bringing to it a degree of energy and determination which should be a challenge to the streaks of complacency observed here and there in Western philosophy, and which may be recognised by the far-sighted as an opportunity for a major programme of profitable industrial collaboration.

OPERATIONAL COMMANDER

Spare and alert, incisive in speech and decisive in manner, Lieutenant-General Minoru Genda is Japan's senior operational commander. At the age of 52 he has passed out on all jets currently in use in Japan and had been appointed to form and command the first Fighter Division, which is to be activated early next year.

The concept of the national wartime hero was somewhat obscured in Japan during the last war by frightful civilian losses, the shaky system of command and the poor communications which existed with the forces overseas. However, from the miasma of defeat and failure Captain Genda, I.J.N., as he then was, emerged with his popularity and integrity untarnished. The "Gen da Circus," which was the popular name for his first squadron command, had caught the imagination of Japanese youth long before the war and its exploits under General Genda's skilful command was frequently featured in the national press.

Genda is in fact more than an outstanding commander of men; he is a brilliant planner also. His breadth of imagination and grasp of meticulous detail played a large part in the planning of the raid on Pearl Harbour; an event which both shocked and shook us but one which Genda and the American air commanders in Japan to-day discuss in friendship and mutual professional respect. He demonstrated that he is in fact a cool professional, rather than a sword-clanking militarist, during his appointment as Naval Attaché in London in 1939-40. During this appointment he studied closely the respective tactics of the Royal Air Force and the Luftwaffe, spending many wet cold nights lying in Kentish fields. More important, he assessed morale and, impressed by the blitz spirit, risked much more than unpopularity by recommending extreme caution to the Naval Chief of Staff, with regard to any contemplated attack on the Allies. His relatively small voice was disregarded and Japan set out upon her disastrous course. General Genda returned home for general mobilisation.

He served with distinction as a senior staff officer to Admiral Yamamoto, Commander of the Grand Fleet, and in other commands until the surrender. Thereafter he remained at his post until he felt that every-

OPERATIONAL COMMANDER



Lieutenant-General Minoru Genda, Japan's senior operational commander.

thing possible had been done to rehabilitate discharged naval officers and men and to defend those who found themselves charged with war crimes. His own record protected him against any charges on this score.

The *Gazette* asked General Genda for permission to write about him and he volunteered an opinion of the English. The translation following is not word-for-word but is designed to retain the meaning. We think General Genda's view is important because it is rare for a Japanese to express his opinion of others.

"The English conservatism in taste belies the radical and progressive thinking of which they are capable, particularly in scientific development.

"The Englishman seems to have an immutable confidence in his Anglo-Saxon heritage which is really self-confidence and which leaves him extraordinarily invulnerable to misfortunes such as the reverses of war; and his marked sense of individuality is transferred to his society, which is conspicuous for the respect accorded to the individual man and for its freedom from bribery and corruption."

If these things are true of us we can be a little proud of them, and both grateful and optimistic because they are understood by at least one man in another small but significant island kingdom whose paradox is that we must compete fiercely with her because her problems are just like our own.



Folk traditions remain vigorously alive in the modern Japan of shipyards and television sets. This itinerant storyteller cycles from village to village, beating his drum to attract the children. He tells them a story with the help of coloured pictures and hopes to sell them packets of sweets. Care for children is a fine characteristic of the Japanese; Japan has the highest literacy rate in the world and spends more per head on education than any other country.



The Mainichi Shimbun, one of the great newspapers of the world, has a Dove (left) as the star of its aviation department. It is used extensively for newsgathering, electioneering, and photography. William Takashi, Mainichi chief pilot, comments that very many times he has appreciated the Dove's handling qualities in bad weather. Its docility and good cockpit vision have frequently enabled him to complete vital press missions in marginal conditions.



Mr. Tan Hayashi, Director of the Civil Aeronautics Bureau, holds the principal appointment for the formulation of policy and the technical regulation of Japanese civil aviation. Under his guidance a pattern not dissimilar to that existing in Britain, comprising part-state, part-private overseas operator together with a regulated network of domestic operators, is taking shape.



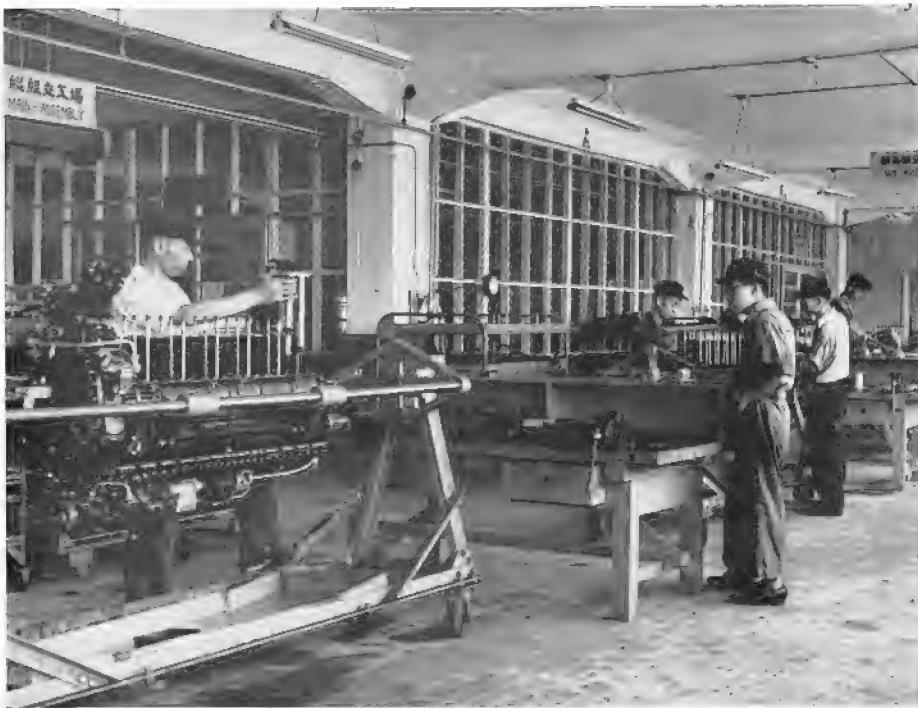
Another approach to newspaper flying is made by Chubu Nippon Shimbun, of the industrial city of Nagoya. Chubu Nippon selected the Beaver because "its sturdy landing gear and short take-off permit cross-wind operation in very poor terrain." Their Beaver is here seen over the Aichi Dam.



Executives of Japan Air Services, the leading non-scheduled operators in the Tokyo district, discussing plans for the operation of their recently purchased Doves at the Ginza offices of Cornes & Co. Ltd., de Havilland agents and the oldest British trading company in Japan. To-day J.A.S. Doves fly between Tokyo and the holiday island of Hachijoshima, about 120 miles off the mainland in the Pacific. From left to right, sitting: P. W. Hewett, Director, Cornes & Co. Ltd.; S. Koya, Director, J.A.S. Inc.; H. Aoki, Managing Director, J.A.S.; and standing, left to right: Y. Takada, Aviation Dept., Cornes; R. Ishii, Director, J.A.S.; I. M. Farquharson-Keith, de Havilland resident technical representative; S. Takata, Chief of Aviation Dept., Cornes; M. Ogino, Aviation Dept., Cornes & Co. Ltd.



Group Captain R. Keary, H.M. Air Attaché in Tokyo, arrives at Chofu Airfield with Mr. R. Okudaira, chief engineer of C. Itoh Aircraft Maintenance and Engineering Co. Ltd., who have been associated with de Havilland in Dove and Vampire affairs in recent months.



de Havilland engines in Japan are overhauled by Shin Meiwa Industry Co. Ltd., at Naruo, near Kobe. Shin Meiwa were famous before the war under the name of their pioneer founder, Ryozo Kawanishi, who died last year.

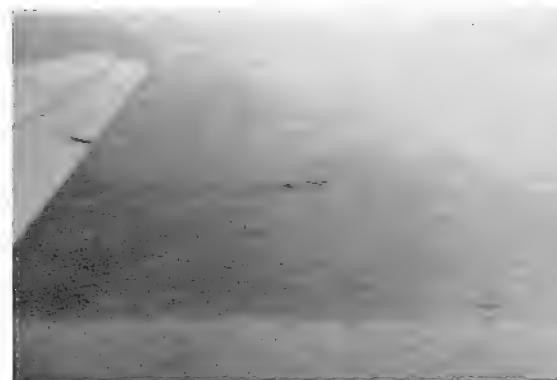
The Kaiyo Aviation Company Ltd. is at present the only operator of twin-engined survey aircraft in Japan, although there is considerable photographic activity by several operators; work in which a number of Beavers share. The Asia Air Survey Company is one such and is fortunate to have a heavy backlog of photography to fulfil. Asia Air Survey say of the Beaver "it is an overworked workhorse but it responds nobly." Kaiyo's own activities extend over unusual facets of the charter business, as is shown by the three photographs below.



Kaiyo outward bound on a mission of contact with a ship in distress.



A Beaver seaplane operates a twice-daily sightseeing service between Sakai, 10 miles from Osaka, and Shirahama, which is famous for its hot springs. The one-hour flight over some of Japan's most beautiful scenery is very popular with holiday-makers and honeymooners. In the right foreground of this picture from Shirahama is Mr. Tadashi Fujimoto, doyen of Japanese civil pilots and a convinced Beaver enthusiast. And the other picture? Well, the Beaver is operated by Japan Aviation Sight-seeing, who are owned by the Sangyo Keizai newspaper, who sponsored the search for Japan's Miss World candidate in October, and they found Miss Midoriko Tokura, and so she's almost a D.H. type, we'd say.



Kaiyo help the fishing industry and raise its yield by locating shoals in the prolific fishing grounds of the Pacific coastal waters. The dark patches on the water indicate mackerel and tuna.



Kaiyo drop supplies to the inhabitants of the Izu Islands, isolated by storm from surface communication. Japan is a land of fierce natural disasters — flood, landslide, typhoon, earthquake — and emergency services are unhappily often at work.





"This is the standard cabin layout, but of course it can be modified to customers' requirements."



"Well, that's it fellas. All you need now is a modification for a mixture control for dry martinis . . ."



"The variant I like
is the one with the
small nape at the
neck of the b'bun..."



"In a bit . . ."



With everything hanging down, the Otter is seen ready to alight on land. The main wheels are retractable into the floats; the nosewheels can be rotated up and over to lie on the decks of the floats.

Otter Amphibian

New version of successful bush aircraft

THE de Havilland Aircraft of Canada Ltd. announce that they have obtained official approval from the Department of Transport for the new Otter Amphibian. This version, at a gross weight of 8,000 lb. is achieved by fitting amphibious floats to the standard landplane.

The amphibious gear consists of a pair of Edo seaplane floats modified to accommodate retractable main and nosewheels. A slight lengthening of the float gives sufficient increase in buoyancy to add 33 lb. over the gross weight of the standard seaplane (7,967 to 8,000 lb.), at the same time making it possible for the wheels to be almost entirely enclosed within the shape of the float in their retracted position.

The functioning components of the main-wheel shock absorber and retracting systems are enclosed within the float shell and are therefore not exposed to water and subsequent corrosion.

The main wheels are installed immediately aft of the step and retract into wells in the float, while the nosewheels rotate through 270° to lie in wells on the deck of the float. All wheels and brake assemblies are made of aluminium instead

of magnesium to ensure maximum corrosion resistance.

Retraction of the wheels is achieved hydraulically. The selector control and unit is installed in the cockpit within easy reach of the pilot. Two hydraulic methods are available, either the standard hand pump or an electro-hydraulic power unit, making extension possible merely by switch selection. The wheel landing-gear position indicator is installed on a plate on the instrument panel which also carries the switch for the power unit when fitted. All wheels are fitted with hydraulic lock-pins which are automatically released for the retraction cycle. Standard landplane single-disc brakes are fitted to the main wheels and hydraulic shock struts are used throughout. The nosewheels are fully swivelling and are fitted with self-centring devices to prevent misalignment during retraction. Twin contact nosewheel tyres are fitted to prevent shimmy.

As a landplane the Otter Amphibian is appreciably easier to handle than the standard landplane version since the technique is the same as with any tricycle gear, which makes for greater directional stability and improved ease

of handling in strong winds. Landing distance, an outstanding feature of the standard Otter, is somewhat shortened as more brake may be applied without fear of nosing over.

On water the Otter Amphibian is virtually the same in all respects as the standard seaplane. Lateral stability has been somewhat improved, since the floats are placed slightly wider apart than in the standard version.

Performance data indicates that such items as maximum and cruising speeds, rate of climb, service ceiling, range and endurance, take-off and landing distance of the amphibian, are almost the same as the standard seaplane version. Pilots' notes indicate that cruise speeds are 3 m.p.h. lower. Take-off distance of the amphibian on wheels is about 10 per cent. more than that of the standard Otter landplane, while landing distance of the amphibian is 3 per cent. less than that of the standard version.

The amphibious gear increases the weight of the basic seaplane by 550 lb., giving the amphibian a basic weight of 5,365 lb. The gross weight is 8,000 lb.

The Otter Amphibian offers all the advantages of both the seaplane and landplane combined. This equipment makes possible the loading of an aircraft at a city airport with passengers or cargo destined for some lake or river camp site located deep in the wilderness. It provides an ideal shuttle service from the landing strip, where transport aircraft may touch down, to the mining or lumber camp which only the seaplane can serve. It provides the answer to many an oil-driller's problem — with drill crews working in swamp lands, on off-shore barges out at sea, or along rivers located deep in the heart of the jungle. From the industrial centres on the plains to the shores of a mountain lake, from the military beach-head on the coast to the rivers of the interior, and from ship to shore — these are only a few of the many hurdles the amphibious Otter is capable of taking in its stride.

Despite the combined weight of both wheel and seaplane landing gear, the payload of the Otter Amphibian is surprisingly high — particularly in view of the many advantages which the amphibious aircraft is able to offer.

The Beaver Amphibian, which was announced in the *Gazette* of April, 1955, has already proved popular with operators in Canada; to date 13 of its type have been delivered.



The amphibious Otter seen at the island flying base, Toronto, coming ashore under its own steam.

Art for Prose's Sake

The Promise of Alf Tinckler and the Challenge of Eustace Booth

A READER has had the temerity to accuse the *Gazette* of neglecting what he describes as "the higher art criticism." We have therefore invited the distinguished critic Alexis P. Gouache to comment on the current exhibitions at the Bloomington and Contemporary Canvas galleries. Mr. Gouache, it will be recalled, is the author of *Medoc and After, Portrait of the Artist as a Young Existentialist, A Housewife's Guide to Modern Art* and the best-selling pamphlet *Root Crops from a Wartime Allotment*. He writes:



Bloomingtons is never dull. Its salons are saturated with the evocative *esprit* of painting in turmoil, the essence of anarchic formal discovery, a *je ne sais quoi* mood of impassioned experiment. And the three painters represented in the exhibition called, quite simply, "Trois," can be congratulated on maintaining the experiment.

Pauline Fletcher-Smith, Tom McScott and Alf Tinckler are brilliantly representative of the new Post-Eyrier school of painters. They have much to deny and they deny it with an eloquent contempt for the arid nakedness of academic impressionism. As somebody (probably Herbert Read) has said, they are "the prophets of meaninglessness."

I shall confine my critical remarks to the most startling of the dozen or so pictures in the collection — to Alf Tinckler's "Television Man." The reproduction does less than justice to this vibrant, intellectual composition, which is galactic with imprisoned light and vivid ambivalent gloom. Tinckler handles pigmentation with a nervous, almost a sensitive, casualness, his thematic browns riding contrapuntally over the ochrous stretches of opaque

flesh. He is only mildly interested in rhetoric, preferring to win his effects by understatement and patterned objectivity. In the programme notes to his picture he explains with crystal clarity that the title "Television Man" "has no significance other than that which the artist himself may care to invest it with" — in other words, this is a painters' painting, a work unconcerned with the communicative urge.

Nevertheless it is possible, I think, to "interpret" the oil. As I see it Tinckler has painted *homo sapiens* tortured by the dilemma of our times — whether or not to commit intellectual suicide by allowing the quartic siren of the screen to possess his soul and the retina of his brain-cells. I may be wrong in my analysis. I hope I am, for this talented young painter-poet will mould his philosophical uncertainty into arresting nothingness only if we resist the temptation to saddle him with comprehensibility.

"Television Man" is not, I need hardly add, for sale.

At the Contemporary Canvas Galleries June and Sidney Gluckenstein have mounted a most interesting collection of academicals. There are contributions by Jones, Booth, Edwards, Cawthright, Higginson, Nelson-Corbishly and, of course, Munnings, and the impact on the senses of so much ratiocinative drawing, so much order, observation and polite documentation, is quite intoxicating. And terribly disappointing and disturbing.

Far too many of our modern painters contrive to give the impression that they want to paint. Wanting to paint is merely a manifestation of adolescence or senescence. It results in the prostitution of talent, and a preoccupation with ideas and images. Ordered painting of the academic school is ideologically suspect because it condones regimentation, planning and the materialism of the dialectician. If painting is not free it is captive.

Of the artists represented in this catalogue none to my mind is more promising than Eustace Booth. This young man (no, I am not patronising — he is but seven years old!) manages to avoid the errors of taste into which most of his more illustrious colleagues fall with sickening regularity. Not for him the idle pursuit of desiccated function! Not for him the precise morphology of semblance and recognition. He paints with a supreme disregard for notional truth and half-truth. He ignores the chains of pictorial syntax, of lens-conscious perspective and rhythmic felicity.

Eustace Booth's picture "Me with Daddy's Watch" is a brilliant little work. Admittedly it owes much to the yearning metaphysical example of Rouault and the elder Picasso, but the composition has enough original naïveté to stand on its own feet. At the moment Booth is in his Warrington Period (most of his pictures are inspired by his physical environment at Warrington), but there are signs — clearly discernible in his handling of the watch theme — that he is progressing towards a more nihilist and therefore more productive zone of perception.

I find it something less than satisfactory that the Gluckensteins should have called their exhibition "Paint in '57" and thought fit to exclude artists from overseas. It is unhappily true that the vast majority of competent artists at work to-day are in Paris, Bruges, Provence, Rome and New York. In Paris the new *école* is represented by Jules Wrobinson, Hans Psmith, Georg Brown and Marie Chones — all of them far superior in technique and nomenclature to our own pedestrian daubers. How, without including such contemporary masterpieces as Wrobinson's still-life "Dover Sole and Chromosome," Brown's "Portrait on Waxed Roofing Felt" and Chone's celebrated Welsh allegory "J'accuse Jack Hughes," it is possible



to mount a truly representative collection of painters, 1957?

The exhibition is open daily (Sundays and Christmas Day excepted) until New Year's Eve. Buses 23, 77a, 206, 391 and 752 pass the door, and art-loving passengers should do likewise.



Part of the machine-shop at Lostock, the Lancashire factory which handles the major share of de Havilland propeller production.

Propeller

A propeller controller is shown here being mounted on a function test rig at the Lakefield factory in Lancashire, the northern overhaul and repair centre of de Havilland Propellers Ltd. Upon return to de Havilland for overhaul, a controller is stripped and inspected. After any worn parts have been replaced, the unit is rebuilt and given an endurance test run. It is then again completely dismantled, inspected, reassembled and checked on the test rig to ensure that all settings conform to specification. A daily check on the functioning of the test rig is necessary to maintain the high standard of accuracy required.





Working to one five-thousandth part of an inch: raceway grinding on the blades of propellers for the Blackburn Beverley at the Edmonton factory in North London.



The trailing edges of the hollow-steel blades of Britannia and Beverley propellers are joined by a continuous electrical weld. During this process, shown here being carried out at the Hatfield factory, the local temperature of the metal as it fuses reaches 1,450°C.

Production

Current Work in the Factories of de Havilland Propellers Ltd.

In order to ensure smoothness of propeller operation the clearance between the blade-root gear segments and the pitch-change gear-ring, known as the pre-load setting, must be set within fine limits. The photograph shows this adjustment being made to a Britannia propeller at the Stevenage factory; the maximum permissible pre-load tolerance on these propellers is four thousandths of an inch between the gear teeth.

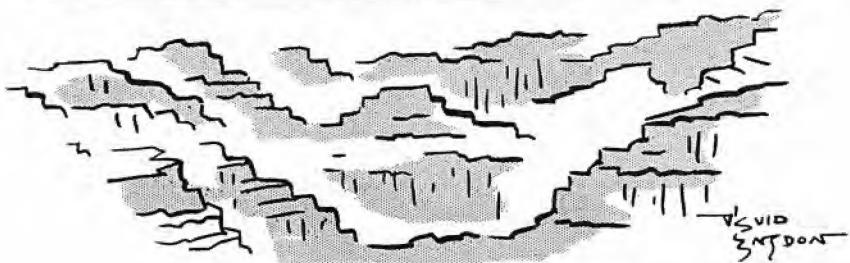




"It's simple. I send cards to embarrass people who sent me cards last year and embarrassed me because I didn't send them any, knowing they won't send me any this year . . ."



"40,000 feet — Chickenfeed! . . ."



"Tchah! Seen it all on Cinerama . . ."



*to arrive without
the feeling of having
travelled . . .*



